

JUNE 1998

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Trenches!
I arrived when I skinned the pile of the water in a trench without any protection in "Bump Pit" (March/April 1995, page 48).

Safety and Health Administration regulations require any trench more than 5 feet deep either to be belted back in a safe stage or to have safety steel of shoring to protect the sides. Neither is apparent in the photo. Everyone, from a multi-million-dollar highway contractor to a backyard digger with a backhoe, is required to adhere to these regulations.

Tom Brennan, Hading, NY

The caption for the photo on page 48 states that the trench measures 3 feet deep but, when the picture was taken, workers had dug down to only 1 foot, says Donnell Karsana, the contractor for the project. The picture also makes the backhoe appear close to the camera when it actually has several yards behind. Nonetheless, mindful of the dozens of excavations and trench related deaths every year, we agree that safety is paramount. The trenches deeper than 3 feet that are not cut through stable rock, the Occupational Safety and Health Administration now requires that the walls be reinforced, sloped or stepped away from the bottom to prevent a cave in. (When Karsana was deeper, he put in a steel shoring box to hold back the walls while his men worked.) And sometimes, the 3-foot rule may be too lenient. Shallow trenches may need anchoring to hold back unstable or saturated soil. (Only an expert should determine whether soil conditions call for these additional safety measures.) "The job has to be reviewed by an expert say some conditions change," says Ted Twardowski, an OSHA safety and occupational health specialist. "Earth is extremely heavy. One cubic foot of earth weighs approximately 138 pounds. Imagine a cubic yard weighing down on you, or 5 cubic yards. That's around 1,080 to 13,050 pounds." (A standard automobile only weighs around 2,300 pounds.) Other trench hazards include

flooding, compromised or gassy (from sewer or other gas), even explosions of a gas line nearby, for instance. A lot of technical knowledge is needed to dig a safe trench. The OSHA Manual course costs \$150. It covers trenching, shoring and trenching safety. It also covers the other OSHA rules. "Sure, they add to the cost of a job but, if the walls collapse, the cost multiplies you."

Gracie Mae

I'm not a hatter and wear steel jacks, a sprig and a shaft (top), but the story on Ben Mabel ("Wood" by Kyle") March/April 1995 inspired me. His life seems to be a lot of evergreen, something worth cultivating in this splintered world.

Joan Foxworth, Luben, Maine

I was more than delighted to see the article about Ben Mabel. I once worked for Parsons College in Clarendon, Co. Maine, and through friends I met Mr. Mabel many years ago. One of my fondest memories was the several hours spent in his home while discussing the order for a new dining room table. I was so pleased to learn that the wonder of his home will live on when the structure is moved. For years we worried about that outcome, with the support of the Forest Protectors.

Grace E. Wozniak, Bangor, Maine

Don't Inhibit

I appreciated your article "Ancient and Old Wood" in the March/April 1995 issue. You left something out, however, and it's my biggest concern. I always hold my breath when cutting treated wood and, after reading this article, I am wondering if wearing a dust mask would be wise.

Brian Lewis, Austin, Texas

Wise indeed. The U.S. Environmental Protection Agency recommends wearing a dust mask "when sawing or machining" pressure-treated wood to avoid inhaling chemical laden particles. Mabel was to buy a mask that has double elastic bands—rather than the less effective, single-elastic version—and has been approved by the National Bureau for Occupational Safety and Health. (Look for the NIOSH listing on the package.) Better still, choose a NIOSH-approved respirator that has charcoal filters for extra protection.

Be Forewarned

After reading Jennifer Marie Lasker's Off the Wall article "The Previous Owners Did What?" (September/October 1995), I took it and turned it. The article itself really has been called "Why You Should Hire a Home Inspector." As a home inspector myself, I see many things that just don't make sense in houses. There are not too many but, if the buyers know some of the problems before buying, they would probably be less frustrated with the other quibbles they eventually discover.

William Horvath, Guilford, Ark.



What's Beneath a Sign

I thought I would send you some pictures of my project in Lewisburg, Pennsylvania—over I was surprised at how this job turned out. The owner wanted to avoid the high cost of a new garage and foundation, so I jacked up the roof of the former car lift and replaced all the studs and plates in the walls with Sells. He is pleased as can be.

Karen Anderson, Spring Pt.

Kitchen Commentary

I was very surprised and pleased to see the layout of the kitchen ("Pole and Plans") in your January/February 1995 issue. Except for the wine cooler, this is the exact layout of the kitchen I have designed for myself. It's pretty good finding to know my design has so much merit.

Laura Towner, Portland, Me.

I have been following the Wilson project on TV as the kitchen elevations on page 95 of "Pole and Plans" caught my eye and told me how different Massachusetts must be. Just imagine standing at the sink, looking out the window to the north and turning your head left to see the double stove and oven and the east wall. Incredible! Everywhere else in the world, where you face north and turn your head to the left, you're looking west.

Robert Weiss, Arlington, Mass.

Massachusetts hasn't changed its compass, the labels on two of the four elevations

downage are exempt. From left to right, they should read: north, south and east.

I am amazed by the Mike Iacono letters ("Picks and Pans," January/February 1998, and "Kitchen Wall Dene," March/April 1998). Kitchen "experts" often place the refrigerator across the rear from the stove. Not to offend Julia Child and Maren Aikawa, but why is the fridge way across the room? I think kitchens should be arranged so much fridge, counter space, stove, counter space.

Dore Young, Mykonos/Neenah, Wis.

Kitchen designer Phil Mosgruber explains Dore Young brings up a good point. In a perfect world, the refrigerator would be down in the back alcove. But, limited by the traffic pattern (back to open refrigerator door would block) and the window placement, we decided to put the refrigerator as proximately to the main area, a good setup for a family with kids who are always in and out of the refrigerator for snacks.

Sprinkler for Me

Thank you for making awareness of automatic house fire sprinkler systems in "Fire sprinklers for Your Home" (January/February 1998). Unfortunately, the article fails to communicate a key reason why home fire sprinklers remain rare. Despite conflicting opinion about local code requirements, the real issue is not the installation of systems but, rather, that most home owners have never even heard of them.

A survey conducted by Butler Marketing Research for the Home Fire Sprinkler Coalition (HFGC) revealed that 65 percent of the 280 single-family-home owners questioned did not need or re-form fire sprinkler systems. Of those polled, 82 percent were not aware that the risk of dying in a fire is cut by as much as two thirds in houses where sprinklers have been installed. Of the 41 respondents involved in installing a house fire sprinkler system as an option, 80 percent were not aware that the risk of dying in a fire is cut by as much as two thirds in houses where sprinklers have been installed. Of the 41 respondents involved in installing a house fire sprinkler system as an option, 80 percent were not aware that the risk of dying in a fire is cut by as much as two thirds in houses where sprinklers have been installed. Of the 41 respondents involved in installing a house fire sprinkler system as an option, 80 percent were not aware that the risk of dying in a fire is cut by as much as two thirds in houses where sprinklers have been installed.

To ensure sprinkler reliability, HFGC urges home owners to use only qualified contractors who adhere to National Fire Protection Association (NFPA) codes and standards and local fire-safety regulations. For further information about residential fire sprinkler technology, HFGC, a partnership comprising three different nonprofit organizations—the American Fire Sprinkler Association, the National Fire Protection Association and the National Fire Sprinkler Association—is offering a free consumer booklet. To receive a copy, please contact the Home Fire Sprinkler Coalition at 1 Battery Park, Box 2121, Queens, MA 02209-9121, 617-551-7230.

Gene S. Kern, Chairman
Home Fire Sprinkler Coalition, Queens, Mass.

Designs as Our Demons

The weekend cottage in "Cottage's Change Everything" (November/December 1997) by Dennis Weidick really caught my attention. I would like to utilize a more fire sprinkler system while the cottage looks like and working it is better. Better. Better. The.

Betty Burrows, The Ohio

The author of our story, architect Dennis Weidick, says he designs client and design the plans. He does not still design for. If you are interested in collaborating the firm to design a house start you have a specific idea in mind, contact Dennis Weidick Architects, 133 Fifth Ave., 4th floor, New York, NY 10003, 212-614-9147.

On Ordering

Why do you print names, addresses and telephone numbers for manufacturers' phone products you return to your distributor when I can't order from them? I called a supplier you listed recently and was informed that's had to be in business to order.

Paula Perence, Salinas Park, Calif.

When you call a manufacturer, it's always worth asking the marketing department for the name and number of a local outlet.

Pardon

I am writing to ask how I can register some back issues. I collect your magazine so well as religiously taping and watching your pro-

grams. There is nothing for them? I am missing the issues for as far back as July/August 1998 and March/April 1997. I am embarrassed if I can't find them at the local supermarket. If you can help, please let me know.

John J. Jones, Laguna Hills, Calif.

To order back issues, call 800-898-7237.



My husband and I saw big lots of the store and have been for many years. This year, we bought a big lot of the store and have been for many years.



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Out Living on the Spacing

I picked for you when I saw "Home's Design Workshop" on the front of your magazine. We have turned our deck into a much enjoyed outdoor porch. Now, to conserve space, we want to convert the French door to swing outward, rather than into the dining room. Let one company or contractor in this area let us know if it's worth the cost to let us out-living longer. Can you help?

Laura McHenry, Salinas Park, Calif.

French doors specifically designed to open out still have a reputation for being the door's most consider flipping around a pair of swinging doors. However, because our swinging doors do fit up floor space in small houses, several manufacturers—both Andersen and Hurd among them—have incorporated them for a reason and we have our half an opportunity to see any of their new doors, but Hurd claims that its new, aluminum-clad exterior swinging doors are the most weather resistant patio models in its line.

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When a new baby comes along, everyone has to make adjustments.



It's not easy welcoming a new arrival. For a while, you'll be feeling a little short on sleep. And if you have other kids, they'll be feeling a little short on attention.

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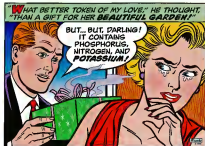
That way, you'll be able to rest easy between feedings anyway.

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OFF THE WALL

BY JEANNE MARIE LASKAR



START SPREADING THE NEWS

Nothing warms a gardener's heart
like a fresh deposit of horse manure

I recently brought Beth, one of my gardening friends, down to the barn to introduce her to Cricket, my new horse, and Sassy, the male I bought my husband for a wedding present. Now I've got, Alex and I have settled into a 50-acre farm. We are new at the liveryback thing.

"This is Cricket," I said to Beth and flopped on the light in the barn. "And this is Sassy."

"Wow!" Beth said.

"Yeah, they're beautiful animals," I said.

"Holy @!%!" Beth said, and that was when it occurred to me that she wasn't referring to Sassy or Cricket. "Look at all that manure!" she said. "This is great! This is really great! Do you know how this is going to change our lives?"

"Um..." I said.

ILLUSTRATION BY LOU BROOKS

"Do you have a shovel? Where's the shovel? Oh, God." With that, Beth rushed over to her car, opened the backdoor, put down a few heavy pieces of newspapers, and began scooping manure right on top.

"Uh," I said. "You want a bag or something?"

"Foolish," she said. "The best fertilizer is the warmest!" I looked at Nancy and Crickles, both clamping on some hay as Beth continued forcing that by-product of life's galaxy. Did they feel used?

One thing I've learned is that people can get sticky when it comes to horse manure. I've read about people who leave manure tea. You soak a sack of manure in a vat of water for a few days and then, presto: liquid manure for your plants.

Now that, to me, that's going too far. Truly, composted horse manure is a gardener's best friend—although my friends would hope to stir a little higher than my manure pile. Still, I understood the allure of manure because I'm a gardener, and horse manure contains the three goodies essential for plant growth: nitrogen, phosphorus and potassium. You can buy these nutrients in the form of synthetic fertilizers, of course, but horse manure is packed with organic material that decomposes into humus, the dark earth that encourages beneficial bacteria to thrive and allows soil to retain moisture. Synthetic fertilizer can't come close to manure for your soil's long-term enrichment plan.

So who wouldn't love horse manure? It's not gross like one manure. Horse manure's stink has a sweetness to it. A scent that evokes images of Little Joe or Tootie—on Lasso legally trailing to church across the prairie in the carriage with the fallo. A scent that takes you to a simpler time or, at least, to a mythical time.

But still, I read about a professional perfumier who has received requests to create a manure-scented fragrance. Unfortunately—on perhaps fortunately—his success was impossible. The only way to make an authentic manure scent is to rub the real thing on human skin.

People devote a lot of time to horse manure. A few years ago, an eight-page book was written as a science project called *Reverendness of Gosh in Compostured Sacks*. The experience? To use of horse manure could make you feel more secure and serene the real.

It did. Which you have to admit is pretty impressive. But still, Eddie Collins, a baseball Hall of Famer who played in the 1920s, said in 1940s horse manure on his barn because he thought it would keep them "loose."

Well, he did compile a .333 batting average over 23 major-league seasons. Which you have to admit is extremely impressive.

But not! There are folks at Moore who hold on to small Harry & Truman Manure Picking Contests, so-called because Truman liked

to start most of his speeches with "horse manure." Events at the annual Harry & Truman Manure Picking Contests include the garden's speed, in which contestants are judged for efficiency, neatness and speed as they distribute a wheelbarrow load of manure onto a manure pile. The fastest's speed is the same except that contestants have to use up an entire bushel of the stuff. In the broken pitch, the person who uses the most manure into the broken wheelbarrow wins.

Manure is a big thing when it comes to manure. That much I understand.

"Watch me," I say to Nancy, who is eating her evening grass while she and Crickles chomp. Alan and I do our best choice. Some times I use the wheelbarrow, and other times I just go wild and leave the manure scoop by scoop, hoping most of it lands in the designated release area. It depends on my mood.

Nancy and Crickles produce a heap of wheelbarrowful of manure every day. And that's just in the barn. I'm not counting the manure they produce out in the field because that is not my responsibility. My job is to find a place to empty a heap of wheelbarrowful of manure every day.

"What's down to these manuremen?" I heartily say to Alan.

"What's better than me," he says.

Without spread composted manure so variously easy to use but and horse manure but we can manage. We spend it on our crops in the garden. We washed a piece of meat with it. We covered some of my green with it.

And we still have three wheelbarrows of manure outside our barn. "What are we going to do with all this stuff?" I say to Alan. Still, I begin to understand the allure of manure-picking contests,

manure-related events, projects and games too. A person out-reached by this much manure inevitably gets inspired.

We do. We think about Beth's manure for the soil. We think about all our city friends and all their city gardens and all the money they are making on urban fertilizers.

"City folk, love manure!" I say to Alan.

"They don't," he says.

That's when we get the garbage bags.

Late, after we've dressed up for an evening out, we head to a housewarming party for Nancy and Jack, two of our city friends new to gardening.

"Here you are," I say, all happy with our dirty gift.

"Your garden will love this stuff," Alan adds.

Nancy is smiling—but in a more confused than happy way.

"Now, be advised," I say, "that there is a little bit of difference between the consistency of horse manure and male manure."

"Manure," Nancy says. She seems to be waiting for some sort of punch line.

"The gifters are male manure," Alan says, "and the horse manure is horse manure. It's all the same to your garden."

"Folks," Nancy says.

"Lemon mule," Jack says.

You can tell that Nancy and Jack do not get it.

"Manure!" Nancy says finally. "You brought us a bag of manure!"

Alan looks at me. I look at him. In his eyes, I see the truth: We definitely should reconsider my mother's birthday present sitting on the truck. ■

A person surrounded by this much manure inevitably gets inspired.

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june 98
extras

Fungus Among Us

think that never needs to be asked or verified? A picnic table that stands up to summer sun and winter snow without a splinter? Wood-polymer composites known as plastic lumber looked like the answer a few years ago. The material supposedly lasts not just for 10 to 20 years because the wood fibers that make up 50 percent or more of its content are protected by a moisture-resistant casing. Improved recycling of grocery bags, milk pails and other plastics? So imagine the surprise of two wood preservationists accounts on their day off from a conference in Florida last year when they headed to Everglades National Park and, upon seeing its flood-control and erosion-control structures under construction, began gazing on beauty.

Manufacturers say that a shelflike fungus found on plastic lumber in the Florida Everglades is only a surface alteration, but some scientists say that the growth may indicate deeper rot.



walk raft made of plastic lumber manufactured in 1994. Leading manufacturers say fungi feed only on moisture dirt and pollen, not the plastic themselves. But skeptics such as Thomas J. Mosher, director of Rutgers University's Plastics and Composites Group and author of dozens of papers on the topic, says that's not necessarily so. Even low-sulfur content propylene plastic lumber, he says, "if you want to put something outside and have it not degrade, you don't want to put wood in it. Wood degrades water

Wundertools

European manufacturers studied some remarkable innovations this year at International Electromechanics. The annual springtime meeting had test and hardware shows in Cologne, Germany. One German company showed off a circuitizer now that others should



their power soon. Expected to be sold in the United States within a year as a tool for firefighters.

or blacksmith. These carefully-tipped blades make it an especially efficient tool, producing two broad thin or sharp blades



Power point stripper: Recently arrived on the market in the United States from Germany.

Another German believes the stripper that shins off as a and whisks the debris into a



quartzite drill. For sale on the
United States steel job.

that remainders face when they pierce veils without knowing who's out of sight.

*Your mind is like a **laji**. Leave the entrance flap open so that the fresh air can enter and clear out the smoke of confusion.*

—Cited From: Today's World

Ring of Fire

Many home owners sweat it out when sweating copper plumbing. Holding a 3,500-degree propane flame in a cramped space, inches from flammable material, requires the nerves of a surgeon. Two tools can ease heart palpitations by confining the heat source to a tight area, thus lessening the risk of an errant spark igniting an inferno behind the walls. One is a clamp-style blowtorch that divides its flame among six small jets as it encircles a pipe. The other, an electric soldering gun, uses low current to fuse pipes, so there's no open flame at all. The pipes will never know the difference.

Plugged into 115-volt AC power, a Kwik-Welder quality electric standard blowtorch cranks out 3,000 degrees Fahrenheit at the center tip of the soldering gun.




A circular air-pet trap can capture
and catch eight times the
number of insects per hour.

With power seen Expected to be sold in the United States within a year as a tool for firefighters.

short, so they don't damage paired and pleural costalings. The binder won't cut glass or stone, but the Swedish company that holds the

patent is working on thousands of blades that will, presumably, power paired variable number of layers attached vacuum cleaners, & other hand-held

replaceable blades spin horizontally, clearing a 3-inch swath. Also intriguing: new hammer drills that switch off the instant a bit touches metal pipe or wiring, ending the nightmare

1

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CRAFTSMAN

MAKES ANYTHING POSSIBLE.

CUTS BOTH WAYS

Band saws shine on curves and straightaways



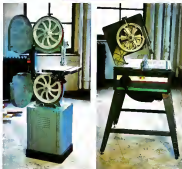
Craftsman's new 10-inch band saw, the band saw can power the smooth, up-bowed curve and my straight thick fence and round off.

met my first band saw at boat-building school. It stood tall, snick in the center of the school's barnlike workshop, a 1/2-ton toner of cast iron surrounded by unfinished dorian and perogonned the soft sounds of sliding planes and tapping mallets. Over the rumbling saw's wear-polished table, one apprentice gently coaxed a piece of mahogany into a moving blade thin as a ribbon on a birthday present. A nudge to the left, then to the right, and a square board became a sweetly curved teardrop. Behind him, clatching pieces of wood, other would-be boatbuilders waited to work some band-saw magic of their own.

My instructor pointed the steady machine and said, "If you're going to build boats, you'd better learn how to use a band saw." I did learn its ways, by pushing more bowed feet of stubborn oak, scented cedar and alspirey through its relentless blade than I care to remember. At apprenticeship's end, I could reuse thick, rough planks into thin boards, make perfect angled dovetail joints and sculpt square stock into beveled-edge curves.

But band saws are more than tools for building boats, as I discovered later working as carpenter, cabinetmaker and furniture builder. Band saws offer a combination of speed, precision, safety, efficiency and quiet unmatched by any

FLOOR MODELS



ALL-METAL BLADES

Aluminum wheels (24 inches across) make cuts up to 15 inches wide possible. A blade guard slides up and down as tool moves for easy adjustment. Maximum blade width: 1/2 inch. Maximum cutting depth: 6 1/2 inches. Motor: 11 horsepower.

NO, IT'S NOT BUCKED

Unlike hand saws with riding wheels, this model has a 421 square-inch work surface that is stationary as the wheels pivot. Maximum cutting depth: 6 inches. Throat capacity: 11 1/2 inches, or 14 inches at 30-degree bend cut. Motor: 275 horsepower.

To cut stock as thick as the guide will allow, a hand saw must have sufficient power. An underpowered saw cuts slowly and strains the blade and motor, which burns the work. It takes at least a 1/4-horsepower motor to cut cleanly through 3 to 5 inches of wood. Zircon's 14-inch has a 1/4-horsepower motor, while the heavy machine processes nearly 3 horsepower.

The key to a hand saw's performance isn't horsepower or cutting capacity—it's the blade. Off the machine, in this, flexible coils were incapable of slicing much more than table board. When mounted on the wheels as steady as a piano string, this strip of metal—half 1/8 inch thick at a bend and moving 2,000 to 4,000 feet per minute—cut out through almost anything.

With dimensions like a blade cut, the narrower its profile, the tighter the curves it can enter without twisting. A 1/4-inch blade, for instance, can follow a 1/4-inch radius, while a 1/2-inch blade can only manage a 3/4-inch radius. And 1/2-inch blades can turn as sharply as a scroll saw but with greater speed. Wider blades, from 1/4-inch to 2 inches or more, cut fast and straight, with no twisting and nearly hawk. Typically used for raising thick boards, these blades require saws with wide wheels, powerful motors and heavy, stiff frames to withstand the high torque that keeps blades in control.

These also want to make curves and don't go straight should manage the trick of changing blades or wide on a width that cuts both ways fairly well—1/4 inch is a good compromise. Norm resolves the cut resistance struggle by having two saws:

1. THREE-WHEELER

An roller (the third wheel) allows cuts up to 10 inches wide with wheels 6 1/2 inches in diameter. Maximum cutting depth: 15 inches. Maximum blade width: 1/2 inch. Motor: 1/2 horsepower.

2. FULL-FEATURED MIDGET

A full-sized power blade guard allows precise, smooth adjustment. Throat capacity: 7 1/2 inches. Maximum cutting depth: 1 1/2 inches. Maximum blade width: 1/2 inch. Motor: 1/2 horsepower.

3. BENCH TWIST

The dovetail motor has no belt to slip or wear out. Throat capacity: 20 1/2 inches. Maximum cutting depth: 2 1/2 inches. Maximum blade width: 1/2 inch. Motor: 1/2 horsepower.



Two ways to "wow" them this Father's Day.

"Uh. Oh. Uh-huh...wow."



"OH WOW!"



ViewMax™ Two-Through depth adjustment. 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 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MAKING THE CUTS



SQUARE ARE TRUE

When Norm Abram installs a fresh blade, he first adjusts its tension to deflect only about 1/16 inch when pressed. While slowly entering the top wheel with his hand, he then starts the pushing screw on to cut until the blade runs a straight line with no hint of waver. After adjusting the upper and lower blade guides, Norm places a small square against the table and against the blade to check whether the table is level. Last of all, he holds a file against the back of the moving blade to remove any burrs that could damage the wheels' rubber tires.



ON A SCROLL

Before its wide right corner, Norm makes a fine relief cut from the board's edge, roughly perpendicular to its layout line. As the blade comes through the curve, waste sticks come off as pieces rather than in one big block, and the blade negotiates the turn without binding. If the corner is not sharp, Norm will change to a narrower blade. For a smooth, apple-fus cut, he applies steady pressure to the work and watches the blade intently, if it starts to twist or rise off course, he slows down.



STRAIGHT SLICE

When reducing thick stock into thinner boards, Norm ensures the straightest possible cut by using the widest blade the hand can handle. For this job, he clamps a homemade pipedrip ripper from to the table and makes a test cut to be sure the blade is perpendicular to the table, the right distance from the blade and exactly parallel to it. The hand man's down-and-swinging blade often has to use power as thin as 1/16 inch without the back-burr or run-up rolls associated with table cuts.



NEAT NOTCH

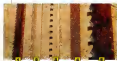
A main gauge makes cranks and notches easy and accurate. Norm simply sets the gauge to the cut angle, adjusts the height of the blade point to just above the wood surface and anchors his thumb behind the gauge—a good habit that keeps fingers out of blade range. When he wants to make identical cuts on separate pieces, he sticks the two pieces and clamps them together with double-sided tape so they won't shift during cutting.

a curve cutter, which opens blades from 1/8 to 1/4 inch wide, and a reserve machine, which has a carbide-tipped 3-inch blade.

Hand-tune blades are usually tightened to 15,000 pounds per square inch, although some—up to 25,000 p.s.i.—may be necessary for resawing. Woodworkers who distrust their saw's gauges compare the nose of a packed blade to a strong fork or hammer's peck. Blasts at 15,000 p.s.i. make an F; those at resawing tension produce a G-sharp.

If's counterintuitive, but the fewer teeth per inch, the faster a blade will cut. Big resaw blades might have two or three t.p.i., while dry blades for sandblasting may have 20 t.p.i. A good thumb rule is to use many-tooth blades on thin stock and sparsely toothed ones on thick. Most woodworkers use blades with four to 10 t.p.i.

Despite their similarity, hand saws are not perfect cutting tools. They aren't portable and can't make plunge cuts, but they do multiply the amount of work that a small shop can handle. And the smoothness of the clean blade showing through knots—it's the most pleasingly hypnotic way to part wood. ■



Bendy Blades

1. Carbon steel is the oldest and least expensive blade metal. Fine for cutting wood, but glued joints and plastic dull it quickly. Won't cut steel.
2. Mineral blades for cutting metal have tough high-speed steel teeth joined to spring-steel bodies by electron-beam welds developed at NASA.
3. Carbide teeth braced onto spring-steel stay sharp longer but are expensive and brittle. Not meant for metal cutting.
4. Banding belts use smooth otherwise unsuitable curves in metal cuts.
5. Teeth made of an alloy of carbide, nickel and cobalt are not as durable as carbide, but they are less likely to break and can be re-sharpened. A favorite in dentistry.

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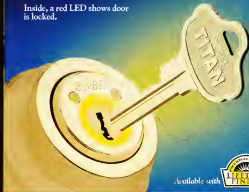
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Like one of the outnumbered Spartans who held the pass at Thermopylae against the army of Xerxes, I stand alone with a naked blade to oppose a blackberry empire creeping uphill into our garden. Thousands of dark tendrils rise 10 feet in the air, blocking the sunlight. ("Good," said the doomed Leonidas, told that the Persian arrows were so dense that in flight they made dark clouds. "Then we will fight in the shade.")

With 2 or 3 feet of cold steel in my hands, old warrior instincts take over. Wading into the thickest clump of vines, I hack them down until sunset, sweat dripping off my grim smile. They prick me a thousand times, but I'm wearing gloves and a long-sleeved shirt for extra armor.

Let imagination off its leash, and soon a sweaty chore becomes a real *adventure*. In any case, it harks back to the play of childhood, with my beloved first machete. It was an LC-14-B survival tool, World War II military issue with safety shoe, leather grip, cutlass-style

PHOTOGRAPHS BY ERIC HARR



Wicked Blades

For your outside work, a 26-inch one about has a use in the back of your arm. Blade A. Thick, curved, curved, curved. Weight: 25 pounds. B. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. C. The old-fashioned blade of the 19th century. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. D. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. E. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. F. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. G. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. H. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. I. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. J. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. K. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. L. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. M. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. N. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. O. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. P. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. Q. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. R. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. S. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. T. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. U. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. V. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. W. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. X. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. Y. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. Z. A nice high but a nice blade in all one piece. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds.

gated and evil-looking break took. I was 12. "Always control the blade," my father once warned, teaching me proper machete technique. "And wear boots, not tennis shoes. Watch your stance. If you can't control your mother will kill you both."

Given a kid a sword, a Saturday and something to chop down, if he survives, he will forever feel master of his own universe. In my nightly dream, Kid Conan was now armed and dangerous, and nighttime monsters got chased to the teeth. Now that I had a way to defend after school, my grades skyrocketed. Dad was a genius, even if his particular mid-school brand of ferberly Darwinism might seem quality as child encouragement. He showed me the extraordinary value of manual labor.

Nowadays, with so many motorized gadgets for twig grinding and branch decapitation, few brave owners study the machete, although coming by hand is good exercise and pollution-free. Near the city, dappled trail and chain saw road, but not here in rural Oregon, simple country folk buy blades and brushwood with their

machetes, blades rising cheerfully as they slice through wood. And as the Chinaman firms, and late-winter laborers scold now after row of emergency sayings into perfect ones a few months before the holidays.

Machete comes to us as a derivative of macho, which is derived from the Spanish word for sleeplessness; early machetes probably began as parson's cutters and became all-purpose tools on plantations and in forests. Inevitably, the U.S. Army adopted them for jungle warfare.

Modern machetes range in size from the traditional 26-inch Caribbean cane-cutter to the comparatively small gardener's versions such as the beavered hillo and the corn knife. Some types have an integral brush hook at the end to cut on the pull stroke, also handy to swing back and move it aside after cutting.

Grab a machete like a tennis racket. Just be sure to lock thumb over fingers because, unlike a tennis racket, a machete is sharp enough to sever your leg on a bad swing. Although a machete can chop down a tree with repeated backs, it wasn't designed as

Sword Sharpening

A sharp machete slices into wood, but a dull one can bounce off and bite you instead. Professional macheteiros work up an edge using only a flat double-cut file, which they push toward the edge in long diagonal strokes. Americans should do the same, while working leather gloves to avoid slicing digits. But a machete will cut better and stay sharp longer if the serrations grooves left by the file are polished out with a medium-grit aluminum. Lay the blade on a flat surface, slowly run the stone at a slight angle from the heel of the blade to the tip. Push away from the edge with light strokes. Some function along the edge afterward on Scotch-lantern ball file. Dropped machetes require a wire edge that makes the first few cuts immeasurably easy, but the edge dulls rather quickly. Save the ball file for a really blood-thirsty tool. The straight razor

Fine Gallery

1. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 2. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 3. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 4. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 5. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 6. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 7. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 8. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 9. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 10. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 11. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 12. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 13. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 14. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 15. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 16. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 17. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 18. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 19. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds. 20. The most machete, a 26-inch long blade that is a real piece of art. It has a curved blade of 18 inches. It has a curved blade in the back. It has a curved blade in the back. Weight: 25 pounds.

be up to safety advice, so I chased the stevedore dog safely to a distant tree and gave jungle law plenty of clearance. His Basking Congo-explosion snarl had too much before-through, and he swung just as wildly even when off balance. Somehow he managed to avoid injury for the first hour, but eventually the machete deflected and shot into his left muscle. After one trip to the hospital, his ghastly 17-inch wound made me recall my dad's advice: Always control the blade. ■

FIRE IN THE PIT

Building an altar to outdoor cooking



When the barbecues flare up each spring and the scent of charring seasoned meat flows across America, it's a wonder how vegetarians keep their resolve. Even a burger broiled on a rocky hibachi has that primal, irresistible hunter-gatherer allure and a tinge of petaline alfresco hospitality. But Dr. Paul Gorkin's family wanted something more than a primitive fire pit to grill the day's catch. So under a gazebo, beside the swimming pool, along a yacht-crowded waterway in Jupiter, Florida, missons Chuck and Paul Polizzo gathered the tools and materials they needed to build the Gorkins' cooker space.

For those who can afford such luxuries, there's no denying the appeal of these massive monuments to the joy of cooking outdoors. They provide broad expanses of counter-top to set down a plate of burgers or basket of buns. Their supporting pedestals, whether built of brick or block, make a perfect all-weather storage space for the utensils, trays and other barbecuing accoutrements. And unlike those movable four-cookers that require bottles of propane or bags of coal-dusty briquettes—both of which have a way of running out when most needed—stationary grills can burn natural gas.

Inside a recently built gazebo in Florida, a do-it-yourself barbecue stands as finished. Mission Creek Polizzo before, created this elegantly fitted structure from a large of concrete block and a other formwork of no cost.



PHOTOGRAPHS BY BRIK BARK



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SBS IN CONCRETE



- 1 The first rule of masonry—make sure that everything is plumb and level—helps Chuck Polanco's mason extend a foot-level base to be sure the barbed-wire wall is 4-inch thick.
- 2 By the end of the first day, the 4-foot-long precast is ready for pour. In all, the project requires 54 pieces of blocks—both 4- and 8-inch-thick—and four bags of mortar.
- 3 Jacked concrete pours, 2 by 2 feet, form the base for the barbed-wire concrete block and grill. Chuck drops three sets of horizontal wires, filling the cavity between with his gravel. He sets the square hole in the pour, lower right, with a concrete stirrer and a dry channel blade. The hole goes the full 4 feet in this pour. It's left after cast opens a concrete pour to 12 inches in the slab.
- 4 A final consistency is water in the mix, to be used to seal it. But rather than try to level the heavy pieces, Chuck waits a day for the mortar to set, then tops them with a kind of stiff mortar 2 inch thick. In this bed, he forces concrete mesh channels, grids, levels them to the proper height and then, using about five rails, sweeps off the excess mortar on the 4-inch-thick slab. After leveling, he will remove the rails, fill the corners and get ready to lay.
- 5 The final bed of concrete block disappears under a refined covering of mortar mix, leveled to an unblemished surface.
- 6 The next day, after the address area, Chuck grouts the rail and changes a chain. All that remains is for the local gas company to hook up the grill and for the owner to go shopping for stools.

For their barbecue, the Gottlieb had a natural gas grill, 6 feet of counter-top and two storage compartments, as well as a refrigerated ice chest for food and a sink. "This is not a barbeque, this is a kitchen," says Larry Maloney of the Fireplace & BBQ Center at nearby Coral Springs and the designer of the Gottlieb's project.

Under the Gottlieb's garden, the Polanco brothers could have built a miniature house, jutting by the middle of wire and pipe poking out of the garden floor: electric wires for the fridge and a gas, water supply and drain lines for the sink, a natural gas line for the drop-in grill. The barbecue cooking all these necessities is going to be sealed in a house rock. Eight feet long, built of concrete block and grout covered with mortar mix, this cooking unit will be connected to the gas grill's 6-inch pipe, a sufficient house main in frame-free Florida. Here the problems are rats, ants, moisture, bugs and rot. "Ten years ago, people built these out of wood, with tile tops," Maloney says. "But these don't last in the Florida climate. Half our business is ripping them out and replacing them with concrete." He lacked a loose block. "That'll last forever with no maintenance."

To avoid blocking the house's water view, Maloney covered the barbecue between two columns on the garden's north side. In a

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FIRE WHEN READY



couple of hours, the Peloton brothers stacked the 4-inch-thick block into a wall 55 inches high, tall enough to provide a 16-inch bucket behind the 39-inch corner. They finished as comfortable as the alcohol, and on their faces. Each chair seemed to divide naturally and wordlessly into Chuck's hands and Paul's position. "Mad," Paul might say, and Chuck would know to drag some bags of mortar over to the whistler for mixing while his brother laid out the barbecue's next element.

With chalk and tape, Paul carefully marked out the location of the two end walls, which projected 26 inches from the rear, so that Chuck, with deft slaps, flips, cracks and taps of his trowel, could skillfully build the 4-inch blocks up to corner height. At the left-hand end, he installed a block with screened holes to vent the refrigerator. If the barbecue unit had been fixed with

If life seems too short for building a fire and waiting for smoke, the quick answer is a gas-powered grill. But which one? The first choice—what size to buy—depends on how many people you expect to cook for. How much they eat and how much you want to spend. This grill ranges in price from \$4 to \$15,000, and as price from a few hundred dollars to \$15,000. (You can find a top-of-the-line cooker with everything, including an infrared oven.) These models when you are grill have either natural gas from a pipe or LP (propane) gas from a tank. These features are rated in BTU. Larry Melinsky of the Fireplace and BBQ Center says 2,000 BTU per burner is the minimum for grilling. "The higher the better to save in the future. If you go for \$15,000, you're throwing your money away." When shopping for this cooker, pay close attention to the number of burners. The more burners, the more power you have. Some manufacturers do a great job of building a burner, which gives the appearance of a significantly higher output.

blacked up the barbecue's facade, leaving openings for the refrigerator and under-counter storage. Flat bar steel bridged the top of these gaps. On the steel and brick, Chuck crowed a ridge of fresh mortar onto which he pressed each panel, then he went back and filled all the power joints. At this point, he didn't concern himself with making the power level—he planned to fix that later.

He set one panel down low, creating a recessed platform for the stainless-steel barbecue sink. "Watch the door," Paul said with

loaded gas, the containment space for the tanks would have been essential too.

When both the end walls perched counter-top height, the Peloton brothers prepared additional supports for the counter-top's 2-inch-thick concrete panels. Against the back wall, Chuck mounted planks of oak block to counter height and connected a piece of angle iron on top of them. Then he

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Wood fibers stuffed up like cotton candy are added to glue to form MDF.



Is it wood, or is it MDF? Only Tom Sellek knows for sure. For last fall's TV project in Milken, Massachusetts, he built the media room's shelves, cabinetry and treatment, above, completely of MDF.

For years, medium-density fiberboard has been the Rodney Dangerfield of the wood industry. Never mind that it is more dimensionally stable than solid wood. That its smooth surfaces offer a flawless substrate for paint and veneer. Or that it can be routed as easily as oak or maple. If people knew it at all—and most don't—they tend either to lump it with its cousin particleboard or to gush about its early, less sturdy incarnations. “The biggest challenge this industry has had to overcome is an image thing,” says Tom Jelen of the Composite Panel Association, which represents MDF makers in North America.

Today, thanks to improved technology and dwindling reserves of high-quality lumber, MDF is getting some respect. Cabinet and molding makers are using MDF more often as a cost-effective substitute for solid wood or plywood. (MDF molding is priced about a third lower than finger-jointed pine.) The furniture and laminate-floor industries

Hot Off the Press

To make MDF, a factory needs a large supply of high-floor finish (the chips, sawdust and shavings—not knots—required by law). The first step is the 20-foot-tall, belt-shaped digester, a 100 pounds-per-square-inch pressure cooker set at 350 degrees Fahrenheit, which softens the wood chips. After a 10-minute steam bath in the digester, the hot, moist wood scraps travel to the belt, where they are injected

between a pair of grounded steel plates—one fixed, one rotating at 1,800 r.p.m.—held just .003 inch apart by a hydraulic ram. Like a pair of mill-stones grinding wheat into flour, the 2½-foot-diameter plates rub the wetted wood apart into individual fibers at a rate of 10 to 15 tons per hour. "It looks like cotton candy," jokes Lofgren of Willamette Industries. "And it's very light, with a bulk density of 3 pounds per cubic foot."

Next, the fibers shoot through a blow line, where they are coated with bonding resin as well as with other additives that enhance fire or water resistance. At this point, says Lofgren, the blend is "just a tall fluffy mat of material" about 18 inches thick, riding on a conveyor belt toward the hot press.

There are two types of MDF presses: the old-style piston press, in which plates of plastic produce individual panels, or the modern continuous press with plates of steel built 100 to 180 feet long that vibrate and accept sheets. Both plates and belts are heated to 350 degrees Fahrenheit so that, after 6- to 13-minute exposures of 250 p.s.i., the glue sets and the thick, fluffy mat becomes a thin, hard board needing only a light sanding.

MDF is usually made in 4-ft sheets from ½ to 1½ inches thick. Some are 18 or even 24 feet long to make joists. "If you had a way to handle it, the boards could be endless," says Lofgren.

After the continuous press, the material goes through a series of rollers to create a smooth, uniform surface. The rollers are heated to 180 degrees Fahrenheit to create a smooth, uniform surface. The rollers are heated to 180 degrees Fahrenheit to create a smooth, uniform surface.

After the rollers, the material goes through a series of rollers to create a smooth, uniform surface. The rollers are heated to 180 degrees Fahrenheit to create a smooth, uniform surface.

have adopted it as a sturdier alternative to particleboard, which chips easily. "When contract writers are turning up in kitchens and bathrooms (As yet, no MDF is suited to outdoor use or extremely moist areas.) And where codes require fire-rated materials, special fire-retardant MDF makes an appearance. (Universal MDF has the same fire rating as plywood.) "We're finding new uses for the product every day," says WD Wadsworth, sales and marketing manager for MDF at Plym Creek Manufacturing.

Not bad for a product that landed in its debut in 1964. Sawmills had long raised their chips, shavings and sawdust into particleboard and hardboard, but the Allied Sawmill in Dupont, New York, decided to make a new kind of siding—stronger than particleboard and less brittle than hardboard—from their own mountains of wood waste. To Allied's regret, these first boards rotted when wet, an undesirable characteristic for siding, but was soon found acceptable indoors as a base for veneered furniture.

As the number of product applications grows, more and more lumber companies are cooking up MDF plans. Most are in the traditional lumbering regions of the West and South, not ready sources of sawmill savings, but some are like near cases, where the waste stream contains copious amounts of wood. According to the Composite Panel Association, U.S. companies shipped 1.2 billion square feet of MDF in 1996, a 432 percent increase from 1973. These numbers are small in comparison to figures for plywood—with approximately 18 billion square feet produced in the U.S. in 1997—but as new plywood plants are in the pipeline (some makers estimate that MDF production has doubled in the last two years alone, bringing down prices from \$12 to \$15 for a ½-inch 4-ft sheet) and increasing MDF's visibility.

Whether most people actually recognize MDF, however, is another story. Mixed in cement and about the same color, it usually looks under a coat of paint as beneath a corner of plastic or wood. Consumers often lump the material together with other man-made products such as plywood, fiber board and particleboard (see "Glued-Wood Gang," page 56.) But while all of these boards are essentially pieces of wood stuck together with glue, MDF consists of wood broken down into fibrils no more than ¼ inch long and in sizes as common fibers. Mixed with a resin and compressed between plates or belts, the fibrils form dense, uniform sheets that are free of knots or other defects.

DOES ANYONE SWEAT FORMALDEHYDE?

MDF is about 92 percent wood fiber, but the remaining 8 percent is glue holding the fibers together. The glue is often composed of urea-based resins that freely off-gas formaldehyde—not a molecule anyone should sniff up. It may cause everything from mild respiratory irritation and watery eyes to nausea, vomiting, abdominal pain and cancer. "The emissions from MDF today are far less than they were 10 or 15 years ago, but they can still be significant," says Alice Wilson, officer of Environmental Building News. MDF emits more formaldehyde than all other glued-wood products including particleboard. "For anyone with a chemical sensitivity, this should be a high-priority concern," Wilson says.

To stem off-gassing, some manufacturers use low-formaldehyde resins or add chemical scavengers to lock formaldehyde in. Low-MDF with laminates, veneers, sealants or paint also reduces emissions. One company makes formaldehyde-free joint sealants-resistant MDF with adhesives similar to those in polyethylene glues.

The MDF industry in the U.S. has a voluntary standard of limiting emissions to 0.3 parts per million. However, George Zemanick of the Environmental Protection Agency's chemical-control division says the standard "doesn't correlate to indoor situations." (The Occupational Safety and Health Administration requires employees to wear workers if higher formaldehyde levels exceed 0.5 p.p.m.)

Tom Jaffe of the Composite Panel Association says 70 tests show that the formaldehyde in MDF never builds up to six months or less. Zemanick is skeptical. He says independent studies are needed to verify the half-life results and to take humidity and temperature into account. "A 50-degree increase in temperature doubles emissions," Zemanick says. As a protective way to limit exposure, he recommends that homeowners stagger purchases of cabinetry and furniture rather than loading up a room at once. "It's unrealistic," he concedes, "to stay away from these materials entirely."

The smooth look means less waste because cut pieces can be used in any orientation. "With plywood, you have to follow the grain, so you wind up with lots of small pieces of scrap you can't really use," says Tim Old House master carpenter Norm Albani. "Whereas with MDF, it's nondescript, so you get more efficient use of the sheet." Also, unlike plywood, MDF is homogeneous, so it can be stained or painted in solid wood. "With plywood, every time you expose an edge, you're put to find a way to cover it," Norm says, "but with MDF the edge is treated just like a solid piece of wood."

MDF has advantages over solid wood as well. Because MDF has nearly the same density throughout, it expands and contracts uniformly and consistently, which decreases warping, cracking, cupping and the like. There's no worry about tear-out, the spiky roughness left behind when router bits and saw blades rip wood grain open. MDF's smooth surface is ideal for paint, which also tends to last longer because of the board's dimensional stability. "I love the way it paints," says John Doe, who often uses it as the job. "And once it's painted, there's no distinguishing between MDF and wood."

Nonetheless, MDF has drawbacks. It's about 50 percent heavier than plywood. "The thicker sheets are almost a two-man job to move around," says Norm. And it's only about a third to a quarter as stiff as solid wood of the same thickness. Sheets of 1/2-inch MDF should be kept to about 3 feet in length or be given extra support to prevent sagging.

Because it's more dense than most wood, MDF requires some adjustments when it comes to fasteners. Nails do not penetrate it easily even when driven in a nail gun, and they can leave a slight pucker around the head. Nailing near edges can break off chunks of the material. MDF holds screws about as well as materials such as Douglas fir but has only about half the screw-holding value of red oak. "I use typical drywall screws, but a counter-sunk screw is better than a flat," says Norm. To eliminate puckering, contractors recommend either using self-drilling screws or drilling pilot holes and countersinking. In any case, however, work well without special treatment.

The same sharp blades and bits, drilling even carbide-tipped ones much faster than most wood. And cutting and routing produces a fine dust that can be irritating if inhaled and is hard on clothes. Says T.O.H. contractor Tim Silva, "You'll want to wear a dust mask to protect yourself, and use a vacuum attachment on your tools."

A tip that won't hurt MDF, but it will irritate if kept in prolonged contact with water. To find out how much, we soaked an uncoated 1/2-inch piece in water for a week. The MDF didn't dissolve, but it floated 42 percent, turned spongy and became home to a thrifty rag-eat colony. Although extreme, our test emphasizes the need to keep MDF dry.

Spurred by the increased acceptance of MDF, manufacturers are experimenting with ways to make it look easier to use and more versatile, offering pre-cut, painted, plastic-coated or veneered molding and artwork as well as stain and thickness. Many are trying the dust-seal of their MDF in more specific applications. (Lower densities weigh less, sag more, but they are used to be stiffer, less brittle and produce sharper edges when cut.) Others are adding the moisture-tough process to make fully stained boards lighter or to eliminate or reduce formaldehyde off-gassing. (See "Does Airborne Formaldehyde?" page 15.)

To date, the efforts to re-link MDF have focused on the furniture and cabinet trade. Most home centers don't stock many of the choices or have much information if they do. Would be MDF buyers have to call the Composite Panel Association for a local distributor. MDF manufacturers must to change that. "If you think about the trade of a house—a 1/2 the painted wood trim around every door and every window, the clear rail, the shut boards that go up at the entrance, the shelving in the closets—that all has to be in wood," says John LeFon, Williams Industries vice president for sales and marketing. "But so wood becomes less available and more expensive, it can all be MDF." ■



Glued-Wood Gang

- 1. PLYWOOD:** Thin sheets of wood veneers, laminated together by an adhesive. The grain of each sheet is perpendicular to that of neighboring layers. The strongest and most expensive man-made wood.
- 2. HARDBOARD:** Highly compressed sub-laminated fibers with a density of approximately 60 pounds per cubic foot. Often perforated to hold paper.
- 3. MDF:** More brittle than hardboard and smoother than plywood or particleboard, a good substitute for veneers. Panel density between 44 and 60 p.c.f.
- 4. PARTICULATEBOARD:** Made from wood-chip and other mill residues. Comes in densities ranging from 30 to 70 p.c.f. Usually used as a substrate for moisture-resistant furniture and laminated countertops. Holds screws better than MDF of the same density but sags more readily.
- 5. PLATE BOARD:** Comes in two varieties: sub-board (like Eucalyptus randomly glued together) and oriented strand board (hard, narrow fibers loosely aligned in the same direction; their grain is always perpendicular to each other). Orientation for both range from 30 to 60 p.c.f.



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IF IT BREAKS, THEY WILL FIX IT

How to play the warranty game

The end came quickly for Robert Ruffel's laptop computer. His daughter, Lauren, had taken it with her to college where, all at once, the battery charges stopped charging and the motherboard started behaving badly. The eventual breakdown of the \$2,500 machine was inconvenient, to be sure, but the timing couldn't have been worse. The laptop was just three months older than its one-year warranty, and the Scarsdale, New York, plastic surgeon figured he'd be stuck with the \$1,100 repair bill. But then Ruffel remembered having bought the unit with his gold credit card, which extended the manufacturer's warranty a full year. "I called the credit card company, and they said, 'Absolutely, you're covered,'" he says. "All I had to do was send them the receipts, a copy of the warranty and the repair bill." In less than a month, Ruffel got a check for \$1,100.

When it costs more than a grand to fix a computer or even \$200 to get a stove running again, it only makes sense to maximize warranty protection. Besides flashing the card, buyers have other ways of keeping fresh purchases from becoming expensive post-warranty problems, even after the coverage expires.

Original warranties for household goods typically last a year, although many appliances come with longer warranties for a specific part, like the transmission on a washing machine. That's what makes reading the fine print worthwhile. But don't worry about registering your purchase with the manufacturer. Sending in the card

ILLUSTRATION BY PHILIP ANDERSON

any means that you'll be satisfied in the event of a product recall but, says Jordan Clark, president of the nonprofit United Homeowners Association, "As long as you can produce a sales receipt or canceled check that proves when you bought a product, you'll get really quickly for warranty coverage. I just make my receipts to the instruction booklet and file them away."

While Clark says "receipt," he means two: the one for the product and the one that proves you charged it. In their gold and platinum categories, Visa and MasterCard typically double the original coverage, up to an additional year, and pay as much as \$50,000 per claim, as does American Express for all of its cards.

Coverage beyond the card can also be had from expensive extended warranties sold by retailers and equally costly antiretro policies issued by home warranty companies. But on the scale of wise investments, these two rank pretty low. (See "Unwarranted Warranties" on the next page.) The only other way of proving losses, albeit limited, coverage is by spending a few dollars to add a rider or endorsement that names a specific item to a home owner's insurance policy. It's not a warranty, so there's no coverage for wear and tear or routine maintenance. But it does cover several perils including theft, accidents, lightning and water damage.

A rider wouldn't have covered the demise of Bush's laptop but, had it failed after his credit card coverage ran out, he might have been able to get a free fix. "There may not be formalized programs to cover out-of-warranty claims, but there is definitely an art of Bushley," says Brian Leonard, an attorney and the author of several books on personal finance. That's particularly true if the malfunction occurs within a relatively short

time—say, two or three years—after the warranty expires and if a clearly recalled from faulty parts or shoddy workmanship. "The more often you call and the higher in the organization you get, the more likely your success," says Mark Connolly, director of a plaintiff's firm for the nonprofit Consumer's Union.

Start by dialing the company's customer service hot line and as you climb the hierarchy, write down call dates and times and the names of the people you deal with. "Chances are that you'll get a different representative every time you call the service center," says Clark. "But if you call and say, 'I talked to Jerry on the 20th, and the last time that day I know you are someone to be taken seriously.'"

If playing the quality-shoot doesn't bring satisfaction, asking some form of a state consumer-protection agency to get in could be a trip to small-claims court (although collecting on a judgment against an out-of-state defendant can prove difficult). The Better Business Bureau and the Federal Trade Commission will, alas, only record your complaint, and that can interfere directly on your behalf, but if the offending product is a washing machine, refrigerator, well oven or other major appliance, you can appeal to a little-known but surprisingly effective agency of last resort: the Major Appliance Consumer Action Program.

Founded in 1976 by the home-appliance industry, the program provides consumers with resolution of otherwise unresolvable complaints. MACAP starts by contacting the manufacturer in hopes of gaining a simple, swift resolution. If that fails, the case goes before a nine-member arbitration panel consisting mostly of industry outsiders including the chairman of the home economics department at the University of Missouri-St. Paul, a retired Baltimore Gas and

Electric engineer, and a senior editor of *Better Homes and Gardens*.

Virtually all major U.S. appliance manufacturers participate in the voluntary program, but few consumers take advantage of it. In 1996, for instance, MACAP worked through 699 complaints, says program administrator Marion Steens. "Most, though not all, of the complaints include information about us in fine print's manuals, but few people actually get that far in the literature."

Too bad, because consumers have a decent chance of winning. (Twenty-two percent of the 1996 complaints were resolved in their favor.) A recent case illustrates how the program works. After buying an electric range in 1993, the owner had problems that repeated service calls couldn't solve. (MACAP opened an file for the story but maintained anonymity for both sides.) In April 1996, the owner asked the manufacturer to replace the \$1,121 range or extend the warranty for another year. The manufacturer agreed to the extension, but in September 1996, after more than a dozen service calls, the consumer demanded a replacement, a refund of most of the purchase price or a warranty good for as long as he owned the troublesome unit. To all requests, the manufacturer said no.

Last June, the owner filed a formal complaint with MACAP. After being notified, the manufacturer offered to refund \$39.99 for an April 1997 service call. When the owner said no, the matter went to the arbitration panel. Within days, the panel recommended that the manufacturer give the owner a new range and that the owner pay the manufacturer \$198.50 (the value of his use of the original unit). "Obviously, not every case goes against the manufacturer," says Steens. "But we have filed calls of lit-

igation from people who were pleasantly surprised by the results of their complaint. That's why it's always worth pushing things to the limit." ■

Unwarranted Warranties

After taking up the mantle of some big-brother boss, and then selling it, the consumer starts pushing the buyer to shift out more for an extended warranty or service contract. It sounds as odd proposition. A few minutes ago this subject was desirable and reliable, now it needs immediate protection. Don't fall for it. At \$10 to \$200 per year, add-on warranties and service contracts are mostly a waste of money. "Our research has shown that if something major is going to go wrong, it will most likely occur within the warranty period," says Mark Connolly of the Consumer's Union. Still, sometimes extended coverage is wise. For heating equipment that needs regular maintenance, for example, the coverage may be cheaper than paying for service calls one at a time.

Home maintenance, which cover major home defects, including appliance breakdowns, also cost a lot—\$500 to \$1000 a year plus \$10 to \$150 per service call—and the fine print may contain caveats that can leave a policyholder with little real protection. And there's always a chance that the home company won't be able to make good on its promises. In 1996, state insurance regulators took over one of the largest extended warranty providers, Home Owners Warranty in Arlington, Virginia, because the company hadn't set aside enough money to cover claims.

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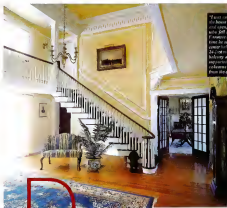
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THE MONEY **PIT**

BY BROCK YATES

PARADISE FOUND

Measure an old house's value in happiness not investment potential



"I just ran out to find the house on eBay, and when I saw Tom, who fell in love with it, I knew it was the first time he'd been in the country. The 20-by-24-foot room features a balcony and staircase supported only by two columns, surrounded from the top."

Does life imitate fiction? I consider that possibility every time I climb the staircase in the center hall of my house in upstate New York. I'm reminded of a scene in the 1996 comedy *The Money Pit* when Tom Hanks, playing the hapless owner of an elegant but decrepit mansion, starts to ascend a floating staircase and the magnificent structure suddenly disintegrates beneath him. Amid a shower of bricks, nails, splinters and shattered plaster bits, poor Hanks ends up scrambling for a second-floor balcony. I'm ever mindful, as the proud owner of an old house, that grandeur

PHOTOGRAPH BY GUENTHER RADON

sweep of architecture and stunningly crafted woodwork can hide darkness. I always trip dramatically, humbled by the knowledge that my own foolish I might trigger a prescription against one innocent man. So be it. What's a calligraphic survey or two on the way to the charms of proper country living?

My scrumptious wife, the lovely Lady Pamela, and I find a complex, genteel life in a cowhouse conversion near Torrington, Connecticut, 18 years ago in Fortressed, a Gerrit Rensselaer estate perched on a wooded hillside on the edge of the historic golf village of Wyoming, New York. Like Herbie and his girlfriend, played by Shirley Long, we believed that clear-thinking adults, accompanied by informed craftsmen and words of cash, could overcome any pitfalls an old house might conceal.

Fortressed beckoned us with Gerrit-like order. Situated on the 16 acres that remained of a 8,000-acre Black Angus farm long since repossessed to neighboring daymen and their herds of halibuts, the 6,000-square-foot mansion and the adjacent eight-pitched carriage house had been built in 1900-'12 by C.B. Marchessault, a rival of John D. Rockefeller in the Pennsylvania oil fields. Lady Pamela and I were hooked the moment we saw Fortressed, especially considering the fire-ravaged prior. We had been shopping for property in southern California, where sellers described everything built prior to the Carter administration as historic and even the most mundane shoe box commanded a price in the range of the GDP of a third-world nation. By contrast, the market for large country houses in upstate New York was sluggish, and the people talking Fortressed were desperate. As a broker told I think in the mirror: "You got to negotiate on a billion being's endgame. That's the basis of real estate."

Lady Pamela and I fervently accept modern terms about structural failures and other interludes. The house's attractions—the soaring two-story center hall with its elegant staircase and balcony, the sootily beamed fireplace, the carved woodwork and the Italian-crafted wall scones and chandeliers—all transcended any possible shortcomings. True, our contractor did warn about the ancient wiring, some of which dated to the days when the house was lit by direct current supplied by its own asphaltum-powered generator. But, the water pressure was dismal in the three top bedrooms. True, the most precious had had

an apparently salvaged beam light fixture, perhaps because the walls remained not a shard of insulation. (This permitted space in the water walls to harbor all manner of small critters—nocturnal house flies, which swarmed across the 14 windows on warm days in a grisly reminiscence of *The Amityville Horror*.)

We ignored the lethargy of my bedroom in need of expansion into a livable space, not minding the observation of Leonardo da Vinci that "small rooms discipline the mind, large ones weaken it." (No wonder his rival Michelangelo and Bramante got the commissions to create St. Peter's.) Oh yes, a major

kitchen renovation was required, not so much as structural improvements including a new roof, foundation repairs, attic re-roofing, painting, papering and modernization.

Fortressed is still a work in progress. I cannot overstate the thousands upon thousands that we have fed into this charming old money pit, because it's worth every last cent to us. The house has been a serene and comforting refuge. Our 27-year-old son now has his battle with a rare cancer here, in a stronger and magical way. Fortressed offered solace and protection during our deepest grief. My wife, a city girl, has never been happier here, even alone on dark, dreary nights.

She cannot explain why. That house harbors us and welcomes visitors, and its value transcends any dollar amount we could place on the timber and glass and

stone that compose it.

Manual funds, cattle futures or even mere stamps would undoubtedly have been a better bet if PJ wanted an investment. But this is a house, not a portfolio. It is the height of folly to push pennies with the expectation that, one day, if the Penn state and the credits don't rise, you will end up profiting from the sale of a house. Had Lady

Pamela and I followed such a path, we wouldn't have purchased Fortressed in the first place. And we would have cheated ourselves out of nearly two decades of unforgettable country living.

Did we find the magic life? Of course not. We've made craves that even Thoreau might find mad. But we have learned to lead our own version of Teddy Roosevelt's wisdom, with style, and carry a far wider net. We also discovered that the tradition and peace of wonderful old houses cannot be measured in material terms. ■



ARMSTRONG AD

You have painted a friends pit, Fortressed. It's not for a few days this summer. Instead, it will sweep several layers of oil paint off the color ceiling and apply an oil-based finish to the walls. Among the frequent facts collected from the previous owners is a rather dramatic statement of independence.



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[Jill Scott — [Trex deck owner.]

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LETTER from This Old House

THE CHURCH OF THEIR DREAMS



TOH's Ann Saxe Thomas, left, and planning and building the new St. Michael's Church in San Francisco project house.

It's Monday, and we're shooting the last show of our San Francisco project. But the job is nowhere near done.

Dodging El Niño, the crew has managed to paint the front facade (as with black trim). The sliver of bare ground next to the front steps has been landscaped with a few plants. Inside, carpenters work over plasterers, who work around electricians and plumbers. But it's too late. Tomorrow night, our tapes will fly to Boston for final editing. Not finishing the project by deadline has happened before. What bothers me is my fear that, although the purchase plus renovation costs of converting this church into a residence peak \$180,000, Mark Dwyer and Laurie Ann Babington may not be getting the house of their dreams. The problem, in one, is that the bedrooms, bath, kitchen and kitchen are jammed into the back of the building. The great space of the chapel, remodeled into a living room, dominates the front. But families need to congregate in their kitchens—not in their living rooms—so what will someone people to use the great space?

I put the question to Mark. He hadn't really "thought" about the design, he says. The layout popped into his head when he first saw the church. He'd heard architect Barbara Chambers in part to play devil's advocate but still revised changing his original vision: master suite upstairs facing east, breakfast kitchen in the old service area, great space reserved for reading, listening to music, watching TV, relaxing. The kitchen and the great space have different textures, Mark says. The kitchen is industrial by design: all tile, stainless steel and haloband lighting. It's a place to stand at the bar, nibble from a croissant—not a place to relax. For that, guests will gravitate to the great room, where they will find easy chairs, a stereo, a flat. I'm intrigued but not convinced. When Tuesday comes, we shoot a few scenes, then fervently close up for the wrap party. After guests arrive, they stand for a while in the kitchen, then move on to the great space. It looks with its leather sofas and chairs, food and drink, the stereo playing "I left my heart in San Francisco..." Given after guests follow this pattern. I realize I'm seeing what Mark envisioned when he bought the place—his vision was a good one.

A month of work remains on the project before Mark and Laurie Ann will be able to move in. At press time, they were eagerly anticipating their big day—and an even bigger day as well: their wedding in Charleston, South Carolina, in late April of this year. We're excited for them. Watch for the July/August issue to see how this project finishes up.

—Steve Thomas

PHOTOGRAPH BY STEFANO MARREI



poured brass

In New York City, they still make doorknobs the old-fashioned way

With a hissing roar, an emerald-green flame fares from a smoky barrel-shaped blast furnace. Two insect-scaled men in heavy leather aprons squat against the acid air, winking as the temperature in the furnace climbs to 2,300 degrees Fahrenheit, hot enough to melt a new mixture of copper, tin, zinc and lead into brass. Maneuvering a steel rod with handbars at each end, they muscle a red-hot crucible out of the furnace, rotate the rod and capsize the vessel. Molten brass pours out, the color of Nikh's strange soda, rushing to fill the voids of a sand-cast mold. Within minutes, a machinist removes the mold, breaking out the rough-edged sand-caked hunk of metal. During the next few days, (continued on page 70)

BY JACK McCLINTOCK PHOTOGRAPHS BY BERND AUERS



THIS JUNE, A craftsman at E.H. Carter, the last remaining commercial foundry in Manhattan, polishes a gold-plated Renaissance lever to give it an antique look. E.H. Carter has been making brass doorknobs by hand since the 1930s, catering to those companies today who appreciate a piece of art. This brass knob by Carter is based on an early 1800s French design.

Installing Vintage Doorknobs

Period doorknobs can transform a dull door as well as add a finishing touch to a renovated house. And while reproduction door hardware abounds, there's nothing quite like the charm of truly vintage doorknobs. A few caveats: One antique knob only fits interior doors, which usually means a company may sell knobs only if they come with spindles and escutcheons, and old screw-in knobs are a thing of the past.

Because the installation may require a variety of fittings, take the knobs, any existing hardware on the door and a paper template of the door's holes to a hardware store. **1** Vintage knobs have spindles either set on the square or the threaded, and there are hole bits for mortises (800 to 850) that accommodate either type.

2 Threaded spindles (80), when combined with threaded knobs, make it simple to fit the knobs on a door of any thickness. If knobs are not threaded and the existing spindle has exterior holes, consider a slide-on spindle (81). Also called a breeched spindle, this piece is designed to allow a door adjustment with the exterior. Prices in a spindle limit the adjustment that can be made. **3** Escutches (82) to \$100 per pair, available in a wide range of period styles and finishes, cover 81 the ends of the knobs and meet 81 the existing hole in the door.

During the renovation of a 1840s house in Lexington, Massachusetts, Tim Gil House contractor Tom Gilve fit an existing door with vintage glass knobs. **4** Gilve inserts the slide knob mechanism into the hole for the face plate. Next, he will test the length of the spindle by holding the knob and inserting it in place. As to other cases, the spindle needs to be shortened. Then come a few more steps: **5** He installs the knobs and spindles, secures the mortises with screws and tests the fit.

created in 1881. It was not only cheap to manufacture (just stamp out the parts) but also simple to use. Dull a couple of holes and pop it in.

By the 1930s, the cylinder lock



had become the American standard, typically supplemented by a key-operated dead bolt. But the advent of cheaper lock-makers, cheaper doorknobs, and that may explain the demand for antique and reproduction knobs today.

At P.E. Gurnee, time travels back to another era. The beauty of the doorknob itself is what counts. A dozen P.E. Gurnee craftsmen hand to their labor like medieval slaves. A doorknob is made in two pieces: head and neck. Finishing the metal base involves the metal, the most geometric part of the process, takes the least time. When the head components emerge from the mold, they snaggy edges and rough surfaces bear little resemblance to a finished knob. A craftsman wears brushes the rough parts and dips them in a tincture to clean them. At a forge, a firm heats the two parts together. A craftsman files the knob and polishes it, then turns it over to a chaser, who taps deformation into the piece by hand with tiny chisels, some for tracing the outline of the design, others for adding texture. One worker then polishes the knob, another cleans it and a third places the design by dipping it in a vat of copper, brass, nickel, silver or gold. Finally, a craftsman examines the part, breaking on one of several finishes, from copper brass or verdigris. It's the blue—the house touch on the doorknob every step of the way—that doesn't come cheaply. The work takes so cutting it is clear to the eye and, most important, palpable to the hand.



Knobs, doors and mortises. Samples from copper and brass. A planing smoothed and polished the same spots as a polished knob, then made the copper silver. The picture is clear: efficiency and economy through the long history of the door. The picture is clear: efficiency and economy through the long history of the door. The picture is clear: efficiency and economy through the long history of the door.



Take knob for spindle set on the square or threaded



Knobs

Threaded spindle





From bottom, left, and Mike Gilgison install a 20-foot wooden flagpole. Ideally, a pole should sit on a level in a sunny place, as the flag flies from 7 o'clock to 11 o'clock. Every day, the flag is hoisted and lowered. Flagpoles should be in the front yard, not in the back yard. The pole should be 10 to 12 feet for a 10-foot flag, 14 to 16 feet for a 12-foot flag, and 18 to 20 feet for a 14-foot flag. The pole should be 10 to 12 feet for a 10-foot flag, 14 to 16 feet for a 12-foot flag, and 18 to 20 feet for a 14-foot flag.

1996

RALLY 'ROUND THE FLAG, BOYS

A flagpole makes a great yardstick project

Long before fiberglass or extruded aluminum, draftsmen working in spy yards used lathes to turn wooden flagpoles—masts with lindolber de alikes. Heeding this tradition, flagpole turners still twist nautical flares are raised by sheaves (pulleys) and halyards (ropes) that are secured on cleats. Some poles even have double or ship masts, yardarms (jaws—here) and gaffs (extra spars perpendicular to the yardarms). Mike Gilgison of Gilgison's

BY VICTORIA C. ROWAN PHOTOGRAPHS BY DAVID ALBANESE

PREPPING THE POLE



1. The day before installation, Norm digs a foundation hole 24 inches deep and 14 inches in diameter, using a post-hole digger and shovel. Because Padkane Farm's honey and clover extremely well, he doesn't need to add gravel or crushed rock before pouring the concrete. (The foundation consists of eight cubic yards of dry concrete mix.) The hole should be high enough that the pole can swing up and down with ease. Norm stands on 4 inches of concrete, then it sits for a few minutes and drops in the anchor. He checks the anchor's alignment using an 11-inch bubble level, then fills the hole with concrete and trowels it smooth.



2. After the concrete has set for 24 hours, Gilligan and Norm cut the pole on two padded sawhorses. In order to center the cleat on the pole's half-yard tail, Norm measures 42 inches from the bottom. Gilligan cuts an "X"-shaped hole in the pole for the 1/2-inch hole.



3. To after the trail (the flagpole), Gilligan and the double cleat into a notch on the top of the pole, so a cleat with the half-yard pointed through lined up with a cleat on the base. Before screwing in the track, he coated the metal and edges with silicone caulking for a water-tight seal. He fits the final, a gold sphere, into a 1/2-inch threaded hole in the center of the track.



4. Finally, Norm adjusts the locking bolt to "open" position. Gilligan uses a spanner wrench to make sure the pole is plumb.

Flags and Poles in San Luis Obispo, California, still creates flagpoles the traditional way: from old-growth vertical grain Douglas fir, which has enough tensile strength to withstand high winds. His custom-made poles taper up from a four-sided base to an octagonal transition piece and a spigot on top.

Although 15 miles from the Pacific Ocean, Padkane Farm in Norwalk, California, creates traditionally styled treatment. Welsh immigrant John Padkane built the exclusive Victorian house in 1879 as the centerpiece of a 380-acre dairy farm. Today, his great-grandson Robert Padkane Scandellbury's family lives on the farm, a cluster of grand buildings on 6 acres. The operation still screens by milking—not cows, but rather the special events and film industries, which have used the site for weddings, as news and television shows including *The Wonder Years* and *Picket Fences*. The main house sits on a wavy lawn with a small apple orchard, the ideal spot, the Scandellbury thought, for a 20-foot flagpole to serve as a beacon for cars on the highway just beyond the gates.

To install a flagpole, the first step is deciding where to tie the pole to the ground. Tom Henning of Henning House, a contractor of Gilligan's poles, recommends installing a track up with PVC pipe couplings. One person should hold up the pole to various spots so a second person can judge the effect from afar. In the Scandellbury's case, however, there was no question that a grassy spot within view from the front porch was most for a flagpole, especially since they already had another pole obscured by olive and palm trees off the driveway.

Gilligan and The Old House master carpenter Norm Adams began by digging a hole and pouring a concrete foundation to hold the ground steel anchor, which supports the pole and prevents ground moisture from working upward rotting the wood. The anchor's brackets usually allow the pole to be lowered easily for painting or major repairs.

The concrete required 24 hours to set. In the meantime, Norm measured 12 inches from the bottom of the pole—which rested on padded sawhorses—to drill a hole for the post hole. Although Gilligan's poles come pre-drilled, Norm and Gilligan still had to scratch the clear and top track, so they cut the flange, through which the bolyards were threaded. Five 1/2-inch screws into the track, dry clean a gold-colored modified aluminum sphere. (Eagles and some westerns are popular options but, in severe wind, a widely flapping flag can pull off a wing or tail.)

Then the pole was ready for firing in the anchor. The main task was holding the pole steady and stepping back to install it. "The alignment of the base really determines the alignment of the pole," says Norm, who coincidentally had flag-raising duty in grammar school. Using the anchor's provided holes in a guide, Gilligan traced holes near the bottom of the pole on two sides to hold another hole, which would hold the pole in place upright. Norm and Gilligan loosened the pole lock to the sawhorses and drilled the holes for the locking bolt. Finally, the flagpole was ready for active duty.

By now, the sun was setting. Although that's usually the time to lower a flag, Norm and Gilligan moved the pole across the lawn and dropped it into place. After tightening the bolt, Norm attached the flag. Everyone watched boisterously as he pulled on the halyards. The flag popped to the top and clanked in the Santa Ana breeze against the orange-crested sky. ■

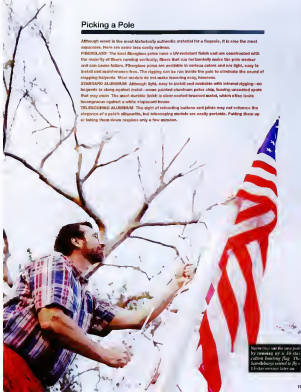
Picking a Pole

Although wood is the most historically authentic material for a flagpole, it is also the most expensive. Here are some less costly options.

FIBERGLASS The best fiberglass poles have a UV-resistant finish and are constructed with the majority of fibers running vertically. Since that run horizontally make the pole weaker and can cause failure. Fiberglass poles are available in various colors and are light, easy to install and maintenance-free. The rigging can be run inside the pole to eliminate the need of stopping halyards. Most models do not make lowering easy, however.

STANDARD ALUMINUM Although light, easy to install and available with internal rigging—no halyards to clamp against metal—some painted aluminum poles chip, leaving scratched spots that may stain. The most durable finish is clear-coated brushed metal, which also looks incongruous against a white clapboard house.

TELESCOPING ALUMINUM The sight of retracting buttons and joints may not enhance the elegance of a pole's silhouette, but telescoping models are easily portable. Pulling them up or taking them down requires only a few minutes.



Norm and Tom tie the new pole by raising it in 12-inch sections. The Scandellbury estate is the 12th section later on.



For Peter King, working a thick slab of clay to form a bowl, which he plans to use as a planter, is a meditative process. Later in the evening, the clay will be stretched and shaped for molding.



"Clay is the only material you physically form with the soft flesh of your hands and fingertips. It's a tough job, and it's not done in a matter of years," says King. He built a pottery wheel system and using slabs of clay that he let air-dry for a day. "The clay becomes more and more rigid until you can cut out shapes in the wheel," he says.

clay carpenter

Peter King's ceramic creations celebrate mother earth and father fire

"Pottery," says Kitto Seward, "I'll like you to dedicate my kiln."

The request takes Peter King by surprise. After a long day in his architectural ceramics workshop in Pensacola, Florida, he is exhausted from slaking, milling, pounding, rolling, laying out, sponging and sculpting 750 pounds of clay that will eventually become a glazed wall of rising and falling ocean waves. The last few days, King has been pondering why he is so obsessed, so in love with a craft that has paid him so little in money. Tonight, after a glass of wine, he has been thinking about this again, absently rubbing his tired eyes, tugging at his beard and stroking his ponytail as the 30 or so men and women who have come to celebrate the first batch of pottery fired in Seward's backyard

BY WALT HARRINGTON PHOTOGRAPHS BY KIT LATHAM

holy struggle around him. Seated in a wicker armchair, he studied under King. So he began singing and laughing his quick Gullah god laugh. "Ha. He. Ha."

"Sure," he tells her. "He glad to."

Soon, to water and soil, people are removing a wire of flame hot handmade pots, bowls and cups from the kiln. Off by himself, King, a thin man in shorts and a casual shirt, has noticed that the prices of the early evening's quarter moon are tilted to five minutes after 7:00. A cooling wind flows from the east. But when a snap, the muggy Florida air presses like an embrace on his skin. The humidity reminds him of a scene from One Hundred Years of Solitude in which a hot wind from the four seas and, Gabriel Garcia Marquez writes, the "air was so damp that fish could have come at through the doors and swim out the windows." King would like to go home, read a few pages of Garcia Marquez and fall asleep. Instead, he thinks "What will I say to dedicate Kate's life?"

Peter King, 60 years old, has been making ceramics for 15 years, taking plans dry, shaping it with his hands and tools and firing it until it is as hard and strong as brick. Like Sassi, King begins with pots, but he then moved on to floor tiles, fireplaces, door frames, gateways, entry walls. In college, on his way to a philosophy degree, he and a friend wandered into a pottery studio. "I remember seeing that first pot being turned on a wheel," he says. "I became addicted." He finished his degree but abandoned plans for graduate school. Instead, he spent up to 20 hours a day at the studio. And, one, on 4-9-80, he was making a pot when he saw a clay in his hands, he had a revelation: "I envisioned these large ceramic columns, and I went, 'You could really make something out of this stuff!'"

It was an oddly persistent thought for a 21-year-old kid with no knowledge of architectural history, or that the Bayfront's historic Gate was a ceramic model, that the lines of Peter decorated temples with columns, that before the 12th century's stark industrial architecture—ceramic pillars, overcast and arches often adorned buildings in the United States and Europe. For years, King made coffee cups and flowerpots and sold them out of an old van at craft shows on the East Coast. Then one day in 1975, he was talking with a man for whom he was working a ceramic cook. The man said he was putting in a new fireplace—and King, on a whim, offered to build it out of clay. 18 feet high, 6 feet wide, in a simple art deco stretch design. He laughs at the memory.

"It was an overnight conversion."

Since then, his Sassi House studio in Fort Lauderdale has produced hundreds of one-of-a-kind ceramic architectural elements. He calls his work "clay sculpture." Spanish, Pacific and Gothic arches, ovens were swimming, Mayan handbells, a decorative that mimics a pipe



top Using an overlay pattern marked with a pin on a sheet of clear plastic, King etches a design into a wet slab of clay for a relief that will depict the last city of Atlanta. He makes inscriptions in the clay with a stylus. 2013: To shape a decorative column, King and his brother, John, use another ancient tool, a piece of PVC pipe. John has worked as Peter's assistant for 14 years.

the brass stain. When I finally get a piece on the wall, it's there: a physical entity. It was once an idea, and now it won't go away. I made sense out of my fingertips. That kind of power is seductive. That's why God made sense out of clay."

King creates stone fireplaces and walls of red clay in a cramped, deep garage workshop. He and two workers start with 100-pound clay slabs 48 inches long, 30 inches wide and 1 inch thick, laying the slabs on giant wheeled tables that crank and move under the clay's weight like a house settling on its foundation. The men use hammers, chisels, hair combs and the tips of their fingers to etch drawings and patterns, especially clay hand-drawn lines as shadowed jet nearby. When sculpting three-dimensional birds, fish, waves or abstract shapes, the men layer up to 3 inches of clay in relief.

While still soft, the large sculptures are cut into pieces and assembled. They are left to dry for two to six weeks before being sealed with 60-grit paper and painted with chemical glazes. Mixed in a walk-in kiln heated to 2,300 degrees Fahrenheit, the glazes create

organic, a door protected by a giant African shield, multi-colored garden gates 13 feet high and fireplaces with Aztec birds, Indian skulls, Jacobean columns, flamingos, great blue herons, dolphins, polar bears, every imaginable flying fish, Egyptian hieroglyphs, dragons, geometric connections, even human faces.

Someone pines King a glass of water.

So, what will he say tonight?

King has been steady lately, returning to himself about his work. "I'm well past 40, and I still haven't made any money," he says. "I own \$30,000 on my credit card." He works seven days a week and lives in three rooms over his shop. He drives a '74 Ford two with an odometer showing 170,000 miles. King's years of artifice constantly collides with stubborn perfectionism. For instance, he once spent to change \$50,000 to build elaborate gates for a sculpture park in Maryland. When he belatedly realized his gates were too small for the setting, he made them 2 feet wider and 2 feet taller—and lost \$15,000.

"I couldn't put that piece out there and have it be less than it could be more. If I don't make money, that's all right. There is an inflexible thing about each piece of work that you know it's right to suffer what anyone says." People so obsessed with perfection are often not to take pride in their work. That's too simple. Pride isn't the source of his motivation, King says. Pride is a product of doing something close to perfectly to be said. "It is an indefinable thing. It's not because others say it's great. It's internal. The Bible says man was made in the image of God. That doesn't mean He has two arms and two legs. It means that, like for God, the more important we do a piece, it's deep in us, somewhere near



King covered 2,400 pounds of clay to create a 16-foot-tall ceramic fireplace surrounding a furnace chimney. He started with a 1-inch-thick layer of clay and added another three to shape the faces.





a flower garden of colors and textures. The fired pieces are hauled to the site and secured by industrial epoxy and bolted screws. King can make about 10 original architectural pieces in a year.

"Going full time, that's all we can do."

King knows pottery who find marketable lines of objects and then work to them, build reputation, make products and save good things. He respects them. He



2001 The King brothers fired a 180-pound slab for the Atlanta relief—a good hour's work. While Peter works clay, a clay addition, some smallish, John shapes a detail using a sense of modeling. "I like vinyl making, but it makes a great roughing," Peter says.

names of getting the job done. "You can be so perfectionist that you can't make anything." He smiles and adds, "Why did God say, 'That is good' so far away after he made man? What he really meant was, 'This is good enough. I'm going home. Tomorrow is Sunday.'"

Tonight, as darkness falls on him and his friends, King is satisfied that as a human he's not had finished last week's good enough. The 34-foot tall fireplace is a collection of fragments, broken bricks and clay pots meant to look like archaeological remains, broken wood blocks designed to look like old stone. One the clay, some from a series of bowls and a piece of last, some smoothed in some, great rough and shaggy in some, glazed spots reflecting the sunlight, a network of spots to tell a story.

Already, King's admission, with a better job he's looking for. If he could remake the fireplace, he would go with a much darker-looking surface, less dramatic light and more color—deep purples, more lavender, and the height is under a Florida sunset. "I always know what a piece could have been," he says, "and that haunts me." The indescribably good feeling he gets in the making must be topped in the next job, or he will be disappointed.

So, how in Atlanta King's life?

Well, he certainly won't reveal the struggles that have been working around in his head the last few days. The story is a story not a philosophical treatise on how creativity and mystery of craft intersect, not a story about the nature of hard work and pride and inspiration, not a sermon on the modern craftsman's struggle. Hell, it's a story. A story has appeared around the moon. To tell it, King has called his pottery into a kitchen at the top of his neck. Everyone is now passing around pottery, which has cooled enough to be lifted and turned and studied in the vague backyard light.

"Beautiful! Wonderful! Look at this!"

Stood inside the empty open kiln and says loudly enough for all to hear, "I've asked Peter to dedicate my kiln." He stands next to his couple in a pose with his weight on his right hand, holding his glass in his right hand at his waist, smoking his beard with his left hand. He looks at the ground, doesn't speak. People go quiet, then uncomfortably quiet. He finally looks up, his face and his eyes will travel, and decide, after all, to tell the something of what has been on his mind.

"People ask me why I do what I do. I make very little money. Why not create a line of pottery that I can make a million and make a decent living? Well, tonight is the reason why I don't. Each time for King or anyone makes a piece of pottery, it's a month for doing it once perfectly. Each piece is like Atlanta burning from the head of Zeus—it is a vision coming forth from your own head. And it's that sensation that keeps us going."

"I know people who come early with a lot of money. They think of their lives in distant places—make money going and be really unhappy and then come and play golf the rest of their lives. I can understand those people. If I were to win the lottery tomorrow, I'd sit at home every day I do today. What I do is what I am. It's not a job. It's who I am."

"A friend once told me that making a ceramic piece is the work of mother earth and father fire and wherever it is doing the making. It is the confluence of material and creativity that makes the object. So here, tonight, we celebrate mother earth, father fire—and King." Suddenly, King picks down his beer like a shot of vodka, spins out, in a wide sweeping stroke, shows and smashes his glass inside the kiln.

"To mother earth, father fire and King!" ■



For his seventh house in Pensacola, builder Michael O'Donnovan commissioned King to build a fireplace incorporating local pre-Columbian and indigenous motifs. On the slab directly above the mouth of the fireplace, 17th-century dishes join Colonial-era pottery shards he collects during visits on the beach.

Standing in the backyard naked? Not the first thing most people imagine as part of their morning ritual. But give it a try—shower outdoors for a week or two—and the open-air splash may become addictive. For a drizzle after a hike or swim, the outdoor shower is certainly practical. But using one daily has aesthetic and sensual dimensions. From the simple chillies blast of a cold-water hose on a hot day to the rapture of a long, warm, wet bombardment, showering afresco is one of life's great under-reported pleasures. It turns a duty into an adventure, the morning shower into an exclamation point of delight. Imagine clear rushing water, blue sky, a refreshing breeze,

perhaps a brilliantly blooming orchid, the sense of nature's embrace. Purely a summer delight in many parts of the country, outdoor showers are a year-round possibility in moderate climates.

At the Curt Meyer family's vacation house in Rosemary Beach, Florida, the attractively simple shower provides the basics. "It's a nice place to rinse off the sand before you go upstairs," says contractor Burnell Elliott, whose crew built it just steps from the wild-rosemary-scented dunes.

Architect Eric Watson designed the 3-by-5-foot shower on a deck at the house's northwest side. Shaded by an outdoor staircase, it has a view of the Gulf of Mexico. For the enclosure, he specified 3½-inch-wide pine pickets weatherized with a dark brown stain to match the exterior trim of the house.

Before the wooden deck was built, plumber Carl DeLong laid underground copper supply pipes, installing shutoff and drain-down valves inside the house's garage, next to the water heater. (For outdoor showers that need... (continued on page 57))

shower outdoors!

A little plumbing, an armful of boards, a day pounding nails, and you, too, can enjoy one of life's great pleasures.



BY JACK MCCLINTOCK PHOTOGRAPHS BY KIT LATHAM



Many Israeli-made products are on the double paths of the Falaj, sign of new commerce. These, later on the day, Mordechai Shalom will share the jubilee's dark, warm air with the Israeli's younger, more, sterner, and bolder.

(continued from page 84) to be waterlogged, Richard Timboney, T.O.H.'s plumbing and heating contractor, recommends hot and cold shower valves inside the house, plus a drain down valve outside in the closet. "That way, you turn the water off inside, turn it on outside and the water drains themselves," he says.)

Inside the side shower chamber at the Meyer house, DeLong and carpenter Mike Sims executed a complicated dance with nails and joists. Norman Mann to do things in the right order, Jones built a narrow wooden box to house the piping and valves. DeLong lined pipes together, ensuring they were the right distance apart to go unobstructed between the joists. He installed a four-way flange in the cold-water line 2 feet above the drain, and brackets to secure the pipes in the 6-in.-wide and sloped the joints.

Next, DeLong put in the single-lever shower valve

Shower talk

For the past 23 years, every day—and every night—until a stroke, last October, Koko Potts had his window look into Florida's beautiful turquoise sea. The stroke ended that peaceful and beautiful view in a heavy metal grille, which she remembers the first and only look she observed. "The fence through the grille fronts in a wonderful ocean with a few albatrosses," she says with a sigh. "Thank she, she will be my eye, and at night the moonlight—oh doesn't get any better!"

The new hot steam-heating system, built the shower themselves, starting with a loan from a firm that makes improvements every year. Here, the San Jose Publicist learned from experience:

OPPORTUNE: "It's summer use," Folgerelli says. "Banding under French masticulation and sticks is used." If the soil doesn't drain well naturally, dig water out and backfill with gravel.

MEASURE. Said the officer for enough from the house to keep mother away, especially if the babies is near. [The beneficial downside of this measure is that, on cold mornings, an officer under the thermometer while waiting for the hot water to flow from the house.]

VENTILATION. "Make sure the house can breathe enough outside air through its dry out the stuff. Otherwise you get slips and mold," says Pallagueri. Rather than building solid walls, use plants and covered walls for visual screening.

SPACE: *Always straighten "your don't slip your clothes on the towel rack or the walls like you do indoors," says Pappalardo.*

ETIPAL. Provides a mirror for observing, a third for stilling—our grasping up a lead for an under-water position, and consider installing an adjustable chrome-hand. "I like the gulps of water. Other people like stringing beads of soap," says Polidori.

One last word of advice: Try showering in the rain. "It's really a great experience,"



1. The frames for the element's 3-foot-3-inch-tall double gates are attached with a 4-inch clearance above the deck, leaving room for pickets to fit in to within 1 inch of the deck. The gates swing out. 2. On the non-facing side of the enclosure, Smith uses up pickets, under-lining with a picket, at a height of 5 feet 7 inches. 3. Carl DeLong installs a first row of pickets, perfect for mounting wood-eaten toys and a blowtorch hose.

privacy for this shower, intended for rinsing sand off swimwear-soaked bathers after a visit to the beach. Moran swept on more brown stains and the shower was complete, save the final rinse. Sun is swished on the water, and is sprayed not beautifully, pellucidly across the deck and onto the hot sand. ■



The complete course shows, in addition, a short history of the French language.

BULLETPROOFING A HOUSE

AN INCREASING NUMBER OF HOME OWNERS, OVERREACTING TO CRIME
AND VIOLENCE THEY SEE ON TV, ARE BUILDING FORTRESSLIKE SAFE ROOMS



A home window with a dense pane of polycarbonate plastic would easily absorb the impact of multiple bullets fired from a Colt .45. Polycarbonate is the same completely transparent material used in bulletproof car windows.

BY CURTIS RIST PHOTOGRAPHS BY MICHAEL LLEWELYN

As targets for assassination, the elderly couple from Las Vegas cut unlikely figures. He's a retired auto mechanic; she's a former real estate agent. They own little worth stealing aside from some antique guns, a stamp collection and a Wheelbag. They live in an adobe-style ranch house in one of the safest areas of the city—the sort of place where a neighbor might be seen walking the dog while motoring alongside in a golf cart. “Still,” says the former mechanic, “with all we hear about on the news, we thought we’d be better off safe than sorry.”

So the couple, who for security reasons asked that *This Old House* not publish their names, built a \$15,000 bulletproof safe room inside their house. If an intruder manages to sneak past the house alarm system and break in, the couple can dash into the plum-colored walls in closet off the master bedroom. With a quick tug, a 400-pound steel door glides into place and locks magnetically. The hansom light above the door has been glazed with bullet-resistant glass. The fiberglass wallboard inside the room is thick enough to block the explosive force of a .44 magnum bullet. The 2-inch-thick steel door can repel even more. “You could pound on it with a sledgehammer probably forever and never get through,” says Gary Postle, a contractor from Westlake Village, California, who rigged

HIDDEN FORTRESS

The most popular—and least expensive—way to bulletproof a house is to add a safe room. “In an emergency, it gives you a place to hide and wait for the police,” says Gary Paster, a contractor who specializes in safe-room construction. A common location for such a bunker is in an existing closet or bathroom. To build the safe room in Las Vegas (see main story), carpenters Michael Baltimore and Marcelino Carpio Jr. added a sliding metal door to the inside of a walk-in closet (1). Considering that the retired home owners were not likely to be targeted by kidnappers, Paster chose a 3/4-inch steel ceiling over a 1 1/2-inch solid core

door—which offers protection from a .44 magnum but not a more powerful wepon, such as a deer rifle. Paster left the raw metal door exposed rather than covering it with a wood veneer, so that would-be intruders could clearly see what they're up against—in hopes they'd flee. “They're not going to be stupid enough to stand there and shoot at a steel plate. But if they were, the bullets would bounce back and kill them,” says Paster. “So, either way, you win.” (2) Inside, he fit the room with a panic button so the couple could contact police and trigger the alarm system in an emergency. When shut, the electronic lock (3) can't be pried or pried open. “You'd have to be Superman to do it,” says Paster. “Make that a couple of Supermans.”



"The safe room is the insurance," says the Las Vegas home owner, happy with the bulletproof room renovation of his bulletproof closet. "You hope you never have to use it, but it's there if you really need it."



up the room. "You'd have to bring a truck in here and cut it several times."

The Las Vegas couple are among a growing legion of home owners prepared to bunker down in bulletproof houses when danger looms. Motivated by fear of thug-led mob and organized, people ranging from Hollywood celebrities and international financiers to gun-plot folks are equipping their houses with bulletproof entryways, windows, walls and safe rooms. "The type of violence you end up with depends on who you are, how much money you have and how many enemies you have," says Michael Baltimore, an insider for Paster in California. For example, a wealthy and mysterious man spent \$233,000 to outfit an entire house with 1 1/2-inch-thick fiberglass armor in the walls

and 2-inch-thick glass in the windows—materials designed to stop military assault rifles.

Of course few home owners are in danger of being, unless they're in the wrong place at the wrong time. But that's not the case here. Home owners need bulletproofing of any sort. F.B.I. sources reveal that household burglaries—by far the most common form of home invasion—have been on the decline since 1992 and dropped by 9.3 percent in 1994, the most recent year for which figures are available. Of the burglaries that did occur—at a rate of about 1 per 64 households—few involved guns. "Burglars usually don't carry them," says Robert McGee, a security expert and professor at Mar-

quette's John Jay College of Criminal Justice. "They know that if they get caught, they will face more serious charges." But in violent materials have served lives at convenience stores, fast-food restaurants and other businesses vulnerable to armed robbery, but residential use remains another matter. "I don't know of a single instance where these materials have saved anybody's life in a house," says Jeff Poyner, acting director of the National Crime Prevention Institute in Louisville, Kentucky. While some people may have a valid concern about their safety and opt for bulletproofing anyway, says Poyner, "for most of us, the threat really is just our threat."

Still, bulletproofing materials are clearly finding their

way into new construction. "We wouldn't even think of building a high-end house without them," says one New York City-based architect, who insisted on emergency exit of concern he might compromise his clients' safety. And the materials are outrageously expensive. Gary Paster's steel, steel door was about \$3,200, not including installation. A popular bullet-resistant fiberglass wallboard manufactured by Safeguard Insulation Services Inc. of San Antonio, Texas, goes for \$15 a square foot, says company president James Trevino. A single bullet-resistant window—such as the one Trevino

Going Ballistic

Most manufacturers of bullet-resistant materials sell them to manufacturers. Laboratories for independent testing. Based in Northbrook, Illinois, the not-for-profit organization—known for its ubiquitous UL listing, on everything from electrical appliances to fire-resistant paper—has its own listing range. "We matter what it is," says Dave Groves, a lab supervisor. "If they send it to us, we'll put it up and shoot it." UL tests about samples at the material three times each from a distance of 10 feet. The material not only has to block the bullet from passing through there also has to be no shattering or shattering of glass or other substance that could cause injuries to people on the opposite side.

Bullet-resistant laboratories have their own set of bullet-resistant protection. Level 1 covers items that can block a 9 mm handgun bullet. Level 2 the more powerful .357 magnum (firing up all 100 ft). Level 3 can block a .44 magnum, and Level 4 a .500 Smith. These ratings are rarely printed on the products themselves. "If they were, you might have a rather thick up to a thick window, look at the listing and say, 'Wow, hand over the money.' We're only got Level 1 protection, and this is a Level 4 gun."

able. That calls for 1 1/2-inch-thick windows, and 1/2-inch-thick wallboard. But in California, the likely firearm is the even more powerful AK-47 assault rifle, requiring thicker protection. "Don't ask me why the AK-47," says Goffrey. "Everyone walks around wearing shorts in the West, so when are they going to hide in shorts?" Concerns may be more realistic overseas, he says. "In Russia, they'll come at you with shoulder-launched rockets."

The nature of a house owner's personal, as well as the depth of his pocket, dictates how much of a house gets bulletproofed. Surprisingly, experts say, the most effective protection is simply to add a house with a bullet-resistant front door. "Nobody's going to shoot at you through the front door," says Carlo Cio,

**BULLETPROOF GLASS**

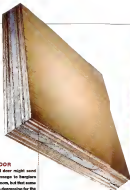
If it's thick enough, ordinary window glass can stop a bullet—but not spalling. The top sample in the stack of left contains seven layers of glass reinforced with layers of PVC that prevent shattering. At 2 inches thick, it can stop a .44 magnum bullet fired at point-blank range. The cost for a 3-by-5-foot window: \$1,000. A still more expensive type of window material is solid polycarbonate, a plastic that absorbs bullets without cracking and is slightly thinner than layered glass. The cost for the same size window: \$2,000.

GLASS BOOR

An early steel door might send the right message to burglars about a safe room, but that same look would be depressing for the rest of a house. One alternative: Build a door with wood veneer around a bullet-resistant fibreglass core. This door, popular for hotel buildings but also available for home use, comes in maple, cherry and walnut.

WINDOW AND DOOR FRAMES

A bullet-resistant door or window won't offer much protection if its frame can be shot through easily. "Once you leave the door or the window properly designed, the frame becomes the weak link," says Thomas Caffrey, a New York City security consultant. He and other experts find the frame with ballistics material (fiberglass, steel or concrete armor, which encases the door or window in provide an additional wall of protection.

**JURY-RIGGED WALLBOARD**

Following a rash of jury room shootouts in the 1980s, the federal government went shopping for a bullet-resistant wall. They tried with the idea of using steel plates, "but the bullet hits that, it ricochets," says Denver Division of Federal Security Services Inc. in San Antonio, Texas. So Independent created America's Fiberglass Fibers came on a beam (fiberglass) and stacked in sheets (right), then held together with a plastic-resin resin. The fiberglass fibers create an impact to absorb the velocity of a bullet and prevent it from penetrating or ricocheting. Although bullet-resistant, finished sheets of America can be easily sawed, drilled and screwed into place on site. "Openings just let it," says Threlke.



a security consultant in Allentown, New Jersey. "They're going to knock the door down, then shoot you." That requires more than a door, however, and a strategy worthy of James Bond. For one extremely anxious client, Caci installed a system that includes not only a safe room but also a secret passage leading out of the house—a sort of last safe room. While operating in the safe room, the owner can hit a panic button to call police or trigger an alarm inside the house that pumps out 120 decibels of sound, louder than what you might hear when sitting directly in front of the speakers at a rock concert. "Unless you're sure dead to that particular sound, you can't go in there," says Caci. In planning the system, he used the owner's request to add an animal cage for another twist: "When all the sound suddenly stopped at that? They'd have a hell of a time on their hands."

As with any home improvement, knowing when enough is enough can be a challenge. "There's no standard, as a single place for these things," says McCann. "And there can arise these problems as well." The varying and variable quality of bullet-proofing materials adds confusion. The most expensive products, such as reinforced windows, usually bear the mark of approval from Underwriters Laboratories. But cheaper products are also on the way, such as 1/2 inch fire-resistant plywood. Although not specifically manufactured for blocking bullets, it can prevent attackers from smashing into a safe room—and costs less than the price of fiberglass. Most bullets won't penetrate 1/2-inch plywood, and attackers are unlikely to show up equipped with a chainsaw.

Unless they know what to expect. By far, the most effective weapon in any home-defense arsenal is surprise. If intruders know that a bullet-resistant door or window or safe room is in place, they'll move with the proper equipment to get around it. So home owners should keep their bulletproofing measures a secret. "Your plumber or carpenter could end up being your biggest threat," says Frazee. "Who has the blueprint to your house, and how do you know they're not going to pass them off to friends who might be robbers?" When a house is built or renovated, Frazee typically shows up after all the other work is done in one day, after that his crew comes and the house owner, knows what's going on. "Surprise, secrecy and stealth," says Caci. "Without those, you might as well have nothing."

With these clues makers complete, the Las Vegas couple—the wheels roll at large in the personal compartment of life knowing that if they have a room, they can hold up in their life forever. "We've tried it out, and it's quite a comforting feeling. I'll tell you," says the husband, Bill, the couple rely live on another for older layer of defense to get them through a crisis their last safe room (in a dog house name, for security reasons, a being withheld).

"Granted, the only weight about 20 pounds," says the husband. "But what a heck!" ■

marble, porcelain, and wood

A strong statement in the master bath of the TV show's project house

Over and a half feet of marble mounting and then just a 22-by-20 feet bathroom the color, weight, pattern of a 1920s head lobby. "With the details, we wanted everything to be straight and square—no over-arched, no over-arched," says owner Mark Dvorak. "We really wanted the understated industrial look."

Mark Dvorak steps on a floor pedal, and cold water from a spigot above gushes into a gigantic sink. Grinning, he starts to stamp out a bass-drum backbeat, shooting liquid dots and dishes down the drain. "Isn't this great?" he says.

Dvorak's water pedal Buddy Rich routine provides a hint that this master bathroom, at *This Old House*'s winter project in San Francisco, veers exuberantly from the quotidian. Features from the industrial world abound. Pedal fittings like these are common for hospital sinks so that surgeons need not touch a tap. The two hummingbird sinks were designed to accommodate patients' trays and buckets. The marble westend once lined the hallways of corporate offices.

"We keep using the term institutional to describe what we are going for here. To some people, that sounds like 'mental institution,' and sometimes I think they have a point. But it really means that we want the lines clean, the details riveting," says Dvorak. A successful store designer, he selected most of the colors, fixtures and details for this house.

The design aesthetic works—in the master bathroom and throughout the 1900 church that Dvorak and his fiancée, Laurie Ann Bishop, are converting to a house. "Our guiding pattern are train stations and old schoolhouses. Those are the kinds of spaces we love," Bishop says. That explains



PLUMBER KNOWS BEST

Antique sinks, tubs and fittings have endless character and charm compared to modern, soulless, shiny-bright bathroom accoutrements. Small wonder that San Francisco Bay Area restorers covet the Ohmura Salvage yard in Berkeley for cheap Victorian claw-foot tubs and vintage jet-setter toilets.

But Jeff Dwyer, master plumber for the Old House's project in San Francisco, offers a caveat: the shed and full bat that old porcelain sink or tub, but stick with modern fittings.

"The fitting takes on those old sinks are a variety of sizes, but that's really not a problem," he says. For Mark Drenick and Laurie Ann Bishop's master bathroom, Dwyer used new fittings with a chrome shank, left. For their guest bathroom, he was able to dig out a chrome washer from his junk collection and make a too-small center bore fit the circa-1900 sink. "After you've been working of this for a while, you collect odd-sized pieces that can really help," he says.

"Check this out," he mutters, holding a pair of chrome flange fittings 60-plus years old. Corrosion pits the flange's interior, and he suspects that the valve assembly will leak.

"Rebuilding old fittings like this is tough," he says, adding that many new fittings convincingly mimic their old-time counterparts. "Generally, if you can stay away from using old faucets, you are much better off."

more. Mounting the sinks directly below the bank of windows made the typical mirror-and-light-over-sink configuration impossible. So Drenick specified light fixtures that rivet out on steel rods attached to the wall. And his mirror solution is equally direct. He simply propped a small antique mirror on the 6-inch deep ledge above the sink.

Light is Dwyer's passion. Any rest-space designer knows that bright opens more product, while ponds in dark corners lurk. So along with the wing nut fixtures, he specified no fewer than five overhead halogen lamps. Suggesting ship's lamps or Paralel headlamps, the round lights ringed by brushed stainless-steel escrow horns don't just look industrial tough. "There are actually escrow fixtures completely sealed and gasketed," Dwyer says.

Close behind the sinks, the bath room's boldest feature is 46-inch-high marble wainscoting. The pickers at Ohmura salvaged the 54-inch slabs from a hallway on the 17th floor of San Francisco's Chevron Building that city remodeling two years ago. Drenick K. Collins excelled them by sign-

gag a top-quality thin-set mortar onto green-board, pressing each slab into place and sealing the joints with epoxy tinted to match the marble's gray veins structure. "The wainscoting reminds me of a 1920s schoolhouse," Bishop says.

But no educational immersion—of whatever decade—ever heated a shower like the one here. 4 feet deep, 5 feet wide and, like the rest of the bathroom, lined with an easy-to-clean ceiling. It's clearly big enough for you. ("We'll save warm," says Bishop, laughing.) The stainless-steel shower features a panel of light-diffusing half-round glass columns known as reeded glass—a look as arresting as the

Smith customer Mark Wells says he'll seal the slots for future bathroom jobs.

The shower still begins as a green-board-lined enclosure within a cast iron drain. In most modern American new-home and new construction projects, waste and vent pipes—and sometimes even supply pipes—are made of PFC. But every inch of pipe in this building is either copper or cast iron. "That's San Francisco code," explains Dwyer. The law was pushed through in the 1970s by union leaders who feared that the use of plastic piping, less labor-intensive to install, would lead to layoffs. While for vintage any vent concerns, particularly for ventilation pipes, there is no denying that cast-iron drains are gloriously silent—a boon here as that bathroom sits directly above the kitchen.

VO If plumbing and heating contractor Richard Tschewy points out another mark of high quality: the pressure-balancing valve, a copper cylinder that looks like the shower's hot and cold supply lines. A small piston responds to a drop in pressure in one line by immediately dropping pressure in the other line proportionately. "At the end, we've got just 50 pounds of water pressure in the water," he explains. "So without this valve, you've got the Pressure! factor. Whenever someone turns on the hot water anywhere in the house, the piston in the shower would force." The valve warns that gas-bumped, pressure-releasing scenario, Richard says. "The adjustments you've made stay true to each other."

To waterproof the shower stall, Collins tucked asphalt-impregnated paper to the green-board, then sealed and sealed roof diamond mesh laid to the paper. Now, he wanted a mix of softboard mud, lime, cement, sand and water on the job. Once the mixture set, he sealed it with three wet coats and began affixing the white tile in the same rapidly paced running bond pattern that green straighteners slipping onto New York City subway platforms.

Adjacent to the shower, the toilet occupies its own enclosure, separated from the rest of the bathroom by a door with another reeded-glass panel. "Putting the toilet in a separate enclosure—the water closet—was one man in Victorian houses," Drenick says. The fixture itself is the water-conserving 1.6-gallon version mandated by California code.

The final touch: Workers sanded and stained the last tongue-and-groove Douglas fir original floor to a bar-washed mahogany color. The radiant heat system installed underneath will keep the floor gently warm for early morning bare feet.

Although the completed bathroom's look is clean, smooth and elegant, it evokes cornered misericordes: those dubbed "modernized industrial, sort of space funk." But Bishop's assurance is more revealing: "It sounds weird, but I feel comfortable in New York subway stations. For me, this is just a comfortable place to be." And the client's own need a place to sit in. ■



Bishop and Drenick made a splash: The polished marble sink on vanity fits the old restorer's vision. Typical hand-applied finish finishes of his water in open construction, but these patches must be changed and held down on the floor chips.

"Everyone falls in love with this tile," says general contractor Dan Plummer. The wainscoting's glass plate allows the underlying tile to peek through on, fresh from the box, already looks 100 years old. The shower's 10-inch-deep built-in seat means making a deep lounge after a tough day.



Feel planted, a brawny arm extended, John Dee presses his paintbrush against the door and begins to bow. The action suggests obscenity at a Shinto shrine, but Dee picks a less reverent analogy: "I look like a figurine on a cuckoo clock." Sublime or ridiculous, he bends in service to his craft. "If you make the movement with the large muscles of the waist, instead of the arm, you get a truer vertical stroke," Dee says. Sure enough, the ocher seath he applies to the stile is as sharp and straight. (continued on page 102)

the art of painting woodwork

Keep a wet edge, bend from the waist and sand, sand, sand

John Dee's painting technique shows how to get the job done. He uses a wet edge to keep the paint from drying out. When John Dee works with his hands, he bends from the waist and bows to the side. He recommends keeping all surfaces wet or painting fast, or else the paint will dry and crack. To keep a door from peeling, he uses a wet edge to keep the paint from drying out. He also uses a wet edge to keep the paint from drying out.



BY BRAD LEMLEY PHOTOGRAPHS BY MATTHEW BENSON

(continued from page 108) in the case of a new highway.

Among the construction arts, painting is the least likely to receive the kind of on-deck analysis. Plasterers, electricians and general contractors all hold licenses, so their skills command respect. But paint is not. Meanwhile, he observes with grudging forbearance, "Most people think they can paint."

But painting doesn't differ from finish carpentry. Only specific, exacting, time-tested techniques will yield a fine product. Dee says that's particularly true of repainting interior woodwork such as doors, windows and trimwork, the most difficult challenges he faces. A full-time painter for 26 years, Dee has honed his brushwork to achieve what he half-jokingly terms the obsessive-compulsive finish. "If you take a perfect, smooth, shop-applied lacquer job in your usual—bad as far that—you won't achieve it," he concedes. "But if you think the perfect, you'll hit excellent. That's a good place to be." So why not take a door off its hinges and



Dee uses water each time he dips his brush into the paint—only up to the coating, not the brush's handle. The paint is 50 percent water-based, which he says is easier to clean up than oil-based paint. Using a wet brush is a trick. You can achieve a smooth finish by controlling the way you use the brush. You can also use a brush to apply a coat of paint to a surface that's already been painted. You can also use a brush to apply a coat of paint to a surface that's already been painted.

strip paint off? "If I do that," Dee says, "but it's almost too thick, especially in older houses. I like the hand-done look of brushed-on woodwork."

The most important, most tedious—and therefore most neglected—way to train on the journey to painting excellence is in prep work. First, Dee determines how well the existing layer of paint sticks to one another and to the underlying wood. He probes peeling paint with a putty knife. If he finds a weak link between the second and third coats of a seven-layer finish, for example, he'll concentrate on stripping down to coat two.

Even an apparently pristine paint surface can hide weak adhesion below. Dee starts tests by marking down a 4-inch square section of dust tape, then jacking it away. At this particular job, a 1993 Georgian-style house in Concord, Massachusetts, the tape pulls up silver-dust-to-steel chips of old paint. "See," he says. "The blue case isn't adhering to the built case underneath." Because this house, like many built before lead paint was banned



Dee gives a new painted product the same treatment as any painted item. He first paints the moldings surrounding the panels, then the panels and last of all the rails and stiles (the horizontal and vertical pieces, respectively). To prevent lumpy lap marks from drying on the rails and stiles, he carefully angles up the panel edges before he paints. With applying paint to each area, he pulls the brush away from the edges and corners, where it might collect in drip-point globs. Strides



direction doesn't matter at this stage but, once the paint is evenly distributed, he runs just the tip of his brush to smooth it gently in the direction of the wood grain. Where the grain changes direction abruptly, as it does where rails meet stiles, Dee doesn't end his brushstrokes abruptly, because that would leave behind an ugly groove of paint. Instead, he paints across any joints that fall in the path of his brush. He smooths out the overlap when he goes on to brush the second pass.



The box of dust paint and primer shows that an exposed paint area will cure a finish. When Dee mixes paint from premium jobs, he always filters it through a paper towel with much of the bottom.



in 1975, undoubtedly comes on stream of mass flesh, like Dem's response and full-body controls. He seals the work area with plastic sheeting and dust tape before he starts scraping. On the sash, he uses a razor blade as a wallpaper scraper and pushes it until he can no longer persuade paint to come up. With a pull scraper, he then digs out the grooves where the door panels meet the sash and rails.

After clearing away most of the offending bit coat, Der begins to sand. On the flat areas, sanding just rids somewhere between a fine sand and coarse rimmed, so it's a fair bet that most weekend painters skip this step—a huge mistake, says Der. Sanding, he adds, ensures that paint will adhere and then marks the dips, ruts and break marks (called rips) left by less skilled predecessors. "If it's really bad, you can use a random-orbit sander on the flat and hand-sand the moldings." Der is a fervent proponent of criticism and hard working, and he doesn't hesitate to use unadorned muscle power. "When I had a job," he says with a hint of pride, "I typically arrive at least as much time as standing and other prep as I do to painting."

Prep Tricks

1 It doesn't require fancy equipment to detect how well paint is adhering. Use just your thumb and a piece of steel tape. Then pull it back to see what, if anything, has stuck to the bottom. This test shows Der how many layers he has to scrape off.

2 One push scrapes the flats with a wallpaper remover and pull scrapers along the panel's edges, where paint buildup is particularly acute. His pull scraper for detail work has a triple-ridged tungsten carbide blade with three cutting edges.

3 A scraped surface must also be sealed. Der's favorite sanding block includes flexible foam working springs for the curves on moldings and open-cell sponge with sandpaper on the flat. He tests sheets of sandpaper in thirds so that the grit-coated faces don't abrade each other, a trick that can save paper but consistently lumps.

over old paint. (He haws wind, he uses a greater relief.) "It's always a good idea to prime, especially if you've done all that sanding," says Der. To topcoat woodwork, he primes silyl (oil-based) primer in water-based latex. "I find that a little better. It dries more slowly and leaves a wet edge longer." He applies the lay with a \$10-\$15 nylon-polyester brush. It's made with a fiber on top and a foam on bottom so that the fibers hold the paint and the foam does the brush. He says, "I've found that's the best way to get the paint on the wood."

Der starts by painting the panels, working each one from the edge to the center. "I'm consciously pulling the paint out of the sides, where it wants to collect," he says. Unwisely double-dip paint is a major cause of sags, so an overworked brush and underworked oil. Once he fills panel with horizontal and diagonal strokes, he "sags off" with a relatively power-free brush. Working at the top of a panel, he pulls the brush down and back up once, gently leveling the surface.

As Der finishes each panel, he reaches for the loop of his painter's pants, where he keeps a cotton rag, slightly dampened with linseed oil, and wipes the surrounding sash and rail clean. He follows his fundamental painting rule: If he cannot keep a wet edge, he makes sure that wet and dry edges meet at a sharp corner. Otherwise,

stopped-over paint dries and forms unsightly raised areas.

When all the panels are done, he paints the sash and rails. He begins at the door's top, spreading the paint in all directions, then sags off only in the direction of the wood grain. Adhering to the maximum wet-edge rule, he paints and sags off all the way to the bottom, covering both sides and rails as he goes. Der takes care not to lap paint back onto the panels or the milled edges. "If you weren't that steady, you could let the panels dry first. Then if anything stopped on the panels, you could wipe it off."

The door does and glazing, Der paints no sash but work. The case he finishes at



medium. Even from 10 feet away, the painted surface appears smooth, clean, elegant.

But Der's quest for perfection can be tricky, as it did when he painted the front door for The Old House's project in Salem, Massachusetts. "It was my first time working with the sash, and I wanted to make a good impression." When he finished, visitors could almost see their reflections in the door's glossy black surface. Later, a member of Salem's historical commission representing house owner Deborah Gosses for having a small door in an area where only wood was allowed. Gosses had to see the misaligned commission straight. "Making the door as smooth as metal wasn't my aim," says Der with a grin. "I just wanted to show what we could do with paint." ■

The steps that apply to painting doors also hold true for double-hung windows and other sash work. Success, says Der, requires thoroughly and uniformly wetting the edge. But the unique properties of paint and moisture require careful technique. "Always paint the sash and first," Der says. "That way, you can move the brush back and not mess up the paint." Also, he deliberately leaves a thin line of paint on the glass at the sash, but he doesn't let the paint get too dry before scraping down. Paint dries rapidly, just as the edges. Instead, he places a straight edge over the glass and pushes the paint into the gap between sash and glass, left. In one step, he gets a clean edge and a good seal with the glass. "It's the best way to do it," he says.



stop those bugs

A focused attack—indoors and out—can rid a house of cockroaches, ants and other persistent pests

EVEN AFTER HIRING four pest-control companies in three years, a Florida family found going into the kitchen at night. Switching on the light would reveal brazen cockroaches crawling everywhere. Baiting was best avoided, as bugs were always piled in the tub. One day, a 1½-inch cockroach fell off the ceiling onto a visiting sister-in-law. The fourth pest-control company, acknowledging at last that sprays weren't going to work, turned to Richard J. Brenner, who hunts down pests the way a combat patrol carries out a search-and-destroy mission.

Brenner, a medical entomologist and research leader for the U.S. Department of Agriculture's imported fire ant and household insects unit, arrived at the house with an odd arsenal: 100 empty paint cans, powdered dentists' grain and a computer. He secured petroleum jelly and mineral oil 1½ inches down the cans' inside rim, as if greasing a barrel pin. He added the grain, placed the cans throughout the property and waited for cockroaches to fall in. "Trapped by the slippery rim, the bugs were waiting when he went back to record his catches. He punched a few buttons on his computer, and out came a color map with little mountains indicating roach concentrations. The four peaks corresponded to an oak tree with main holes whose branches had fallen off, so two big piles and, mysteriously, to the flat roof above a former carport enclosed to make a Florida room. "So we went up there at night with flashlights," Brenner says. "Sure enough, it turned out that the flashing was bogus. The cockroaches were living behind it. It was the ecological equivalent of a tree hole." A dryer vent was their highway to the house. One application of poisoned bait, and the plague was nearly wiped out.

This precision targeting is far from the usual approach to fighting cockroaches, ants, silverfish, spiders and all other small hard-bodied household invaders. Usually there's a declaration of war—but no focused attack. Some people attempt to starve the insects out of the house, becoming fixated about cleanliness. A worthy strategy, but it's rarely sufficient. Other people see a bug and reach for spray—an impulse that adds up to \$250 million to \$300 million in annual sales for companies that make aerosol insecticides, estimates Bill Robinson, an entomologist at Virginia Tech's urban pest-control research center. "We do take some pleasure in watching the little roach die," he says. And the sprays go on killing for a while (two days on stainless steel but two weeks on bare wood, which is more absorbent). As a long-term strategy,

ONE WOMAN WHO BATTLED ROACHES AND FINALLY WON

Lesley Magdon showed her one-bedroom apartment in Portland, Oregon, with an extended family of American cockroaches. "I used to kill an average of 13 a day," she says. "Usually by hand, with my feet as if I had an extra second to reach for one, a better trick!"

"One summer told them about their nest. For months, she put the powder in little containers, as if it were food, for the roaches to eat. Meanwhile, they continued to multiply. "I wasn't doing it right," she says.

Eventually, Magdon realized that she should "poor" the powder along baseboards, near the corner of cupboards and behind her stove, where the roaches were certain to walk. She did this using a plastic kitchen bottle, and her cockroach problem disappeared. She then discovered the vacuum-spraying method at night and around her kitchen sink. Now, she sprinkles borax and the roaches before she goes to bed. "The roaches die or off," she says, "and they're doomed."

"Magdon still hasn't eliminated the roaches entirely. She probably can't without the full cooperation of every one in the dozens of apartments in her complex. Nevertheless, she now uses only one bug every four or five days, a marked decline from five years ago, when roaches ruled her nest."

however, spraying isn't effective. First, pesticide tends to kill only the most hapless insects. A few survivors can multiply into a whole army of resistant bugs. Also, sprays often kill only leaf eaters without reaching breeding places, either inside or outside. Even whole-house perimeter spraying offered by many pest-control companies isn't foolproof, Brenner says. "It's like facing a minefield and hoping that one of your enemy planes runs into it."

He has never forgotten a pest-control job by one of his professors, University of Illinois entomology expert William B. Howarth. In a pest management program, intervention is most successful if directed where the roaches are concentrated, immobile and accessible. That's the L.A. strategy works in every sense, Brenner says. "If you're going to clean up air pollution, where are you going to do it? At the underpasses. It's a little bit strange—usually what the Japanese did at Pearl Harbor."

Cockroach traps can be concealed from almost any container if the insect rim is ground. Brenner built with powdered gum, a by-product of alcohol distilling, because it's not sticky. Dry dog food or ratna also work. Purchased traps can be used, but the cost adds up. Each bait station accurately detects cockroaches only within 4 feet, and traps are needed throughout a property to monitor for most types of the bugs. If German cockroaches are the target, there's no need to survey outdoors. These pests live only in heated structures—but sometimes in surprising places. Harold Adams made prime bait-bait. Once, Brenner found 82 cockroaches in a neighbor's hollow leg.

It's often possible to get a moderate cockroach infestation under control without exterminators, merely by killing bugs trapped in the containers. "Leaving the roach in the nest is the most sure," Brenner says. For better information, he recommends replacing an infected trap with poison and a child-resistant package. Unlike sprays, bait stations don't contaminate their surroundings. The bait station isn't the bug, however. "Don't buy something for the little roaches—German cockroaches—if you've got the big ones," Brenner says. "They can't get into the trap."

If roaches are breeding in a true hole, as he often finds, he places the bait at the end of the hole. With axes, Brenner changes protocol. "They send out foragers, who go back and tell everybody else where the food is," he says. "If you trap the foragers, the message never gets back." So he lures the stowaways with sugar water and waits for next waves to follow. If border gardens he replaces the cotton with hot-biscuits.

This approach still requires

sealing off sources from the outside and eliminating the pests' food and water, but it should make these tedious chores more effective as well as identify the roaches to focus on first. Crawling tracks and crevice dusts don't destroy and spread slowly, but many people never get to it. Baiting pest-control operators perform the service, the most likely prospect are exterminators who offer integrated pest management, often noted as IPM in the yellow pages. Joe Ender, service director for Standard Exterminating in Queens, New York, charges \$90 to craft roaches in an apartment and \$125 to \$150 for a house. He fills bug gaps around pipes with copper wool, which rodents can't chew through.

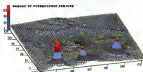
Caulking is most effective when the roaches get into a house from below cracks. Helpful measures include trimming back vegetation, removing wood that shields, replacing weatherstripping on doors and cleaning pipes that collect dry soil, so there's no need to imagine new holes.

Isolates, a light application of bone acid, crystals derived from mineral bones, can thwart pests that do manage to enter. It can be dusted behind stoves or refrigerators or pulled from square holes in pan-covers. The powder, a stomach poison, is effective against cockroaches, ants and many other insects. Two other powders can also serve as barriers because they seal doorways. Silica aerogel should be the way coating on a watch's condenser. Deterrents such as certain of rough repellent particles that scratch off the wax and oil into the shell. Even with all of these measures, however, at some point it might make sense to decide how many bugs are tolerable.

"Don't assume that every bug is bad," says Rod Crawford, curator of arachnids at the University of Washington's Burke Museum. Spiders, for example, are on everything from cockroaches to bedbugs. "The larger the house you're, the more household pests it must have some to get that size," Crawford says. Keeping the thought in mind may make a little sense in the house seems less awful.

Cockroach Hunters at a House in Gainesville, Florida

On Richard J. Brenner's map, pinky-meat-baited traps baited with bait, left, are set out on the roof of the house, outlined in yellow. Camera data represent him.



BUG-PROOFING A KITCHEN

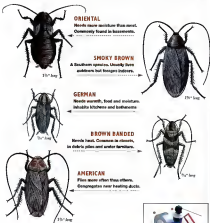
Hard-to-find roach bait with insecticide is better if they have all the necessities for survival while easy reach. Synthetic changes can make roaches. First, so they say at the end, "Do Not Feed the Animals." Cut off access to roach traps can survive on water alone for six weeks. And eliminate shelter. "The more hiding places, the greater the number of pests your traps can support," says Patricia Zargali, an entomologist at Gloucester University in South Carolina.



cockroaches

Cockroaches have been around for 350 million years. In instead of being revered, these insects are almost universally despised. Researchers believe they are a major cause of allergy. Last year, the *New England Journal of Medicine* published a study that found proteins in roach feces were the most common trigger of asthma among 478 inner-city children.

Effective cockroach control powered heat stations, bait and crushed, dried flowers of the pyrethrum plant, which is related to the common chrysanthemum. Synthetic pyrethrins can be quite potent, but small amounts of natural pyrethrum are relatively harmless to vertebrates. Asthma sufferers should keep in mind, however, that even a little pyrethrum can trigger allergic reactions.

**ORIENTAL**

Needs more moisture than most. Commonly found in basements.

SMOKY BROWN

A Southern species. Usually found outdoors but invades indoors.

GERMAN

Needs warmth, food and moisture. Invades kitchens and bathrooms.

BROWN BANDED

Needs heat. Common in closets, in debris piles and under furniture.

AMERICAN

Flies more often than others. Grooming near heating ducts.

GEAR FOR A COCKROACH SAFARI

- Compressed air (a) to root bugs out of hiding.
- Flashlight (b) for peering into cracks.
- A yellow light (c) or a flashlight with a yellow filter (d). Cockroaches, like most insects, can't see this part of the spectrum.
- Dust tape (e) to seal off joint gaps.



pantry pests

Weevils and pantry moths multiply whenever grain is processed or stored. Eliminating these bugs is nearly impossible. Some products sold at stores claim to destroy eggs or larvae, says Dr. Philip Chapman, an entomology professor at North Dakota State University. The best strategy is to transfer food into tightly sealed containers, so no infestation can spread. If small moth pellets appear, swap the food by freezing it for four days at zero degrees Fahrenheit or by baking it at 140 degrees for half an hour. Any debris can then be sifted out. If moths or beetles show up outside containers, clean the cupboards thoroughly. It may help to sprinkle borax acid in corners and to set up pheromone traps, which use the insects' own sexual scent to lure them to sticky traps.

**INDIAN MEAL MOTH & LARVA**

A common pantry pest, so common because it first infested stores.

**RED FLOUR BEETLE**

Devastates cereals and flours that have infested feed pink and make it taste and smell bad.

**CARPENTER ANT**

A serious structural pest. Causes little damage to build a nest, often in moist and rotting wood. Your recent presence indicates that the nest is probably within a beam's structure. If ants are absent in winter, the nest may be in an unheated wall or outdoors.

**ARGENTINE ANT**

A major pest. Does not sting. Works in lines.

**IMPORTED FIRE ANT**

Builds large mounds outdoors. Biting is painful, even dangerous to children. Needs protein, fat and carbohydrates.

**BLACK WIDOW**

Found in most of the U.S. Less than 1 percent of bites to humans are fatal.

**ROACH**

A North American pest. Bites may become infected and take months to heal.

**DADDY LONGLEGS**

The one "spider" that many people love—but it's not technically a spider.

**BROWN RECLUSE**

A Southern species, also called a fiddleback. Bites cause persistent sores.

**HUNTING DOWN ANTS WHEN THERE'S NO TRAIL TO TRACE**

Tony Dahl is a pest management specialist at the University of California's Integrated Resource Center in Berkeley, California, but the last time *Argentine ants* invaded her apartment she was in *France*. "In the past, I'd follow an ant trail back to its nest in the early spring, then put out one of those *ant-proof* bait stations. The ants take the poison back to their nest. This time, though, I wouldn't even decide where to place the bait."

Dahl says she has learned from experience that ants can build nests inside a house, often in the wall of a *parted* place. In the past her house plants regularly and *unwashed* the gaps in back of its water. "The ants don't bite me and," she says, "they'll actually make little bridges with their bodies to cross the water and *on top* back over the wall."

But Dahl kept looking out around the house until, one day, she noticed a small ant on its side and *on* several hundred of them. Apparently, the little insects had built in and *high up*, where it was warm and out of the way. "I took the red wire in the wall and *damaged* out half a cupful of ants," Dahl says. Turning on the tap, she watched them *down* the drain. And she laughed. "You don't think of your house as a wildlife sanctuary until something like this happens."

ACE

When you
don't exactly
have a
green
thumb...

see the
folks in the
red vest.

Margaret
Ann Perennials Hardware

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RAIN

ROBOTS



THE POSTER
(continued)

sprinklers serve when nature doesn't

For most Americans, a first-past-the-post election is a foregone conclusion. Yet, without the humble brass sprinkler, houses might still be haunted by weeds and locusts of locusts (yet, so they were until the mid-19th century). In 1871, 30 years after the development of the rubber hose, Joseph Leeber of Buffalo, New York, patented one of the first commercial lawn sprinklers that did not require the "constant attention of an attendant." His Portable Fountain and Lawn-Sprinkler looked a little like a robot in the shape of an alien man. Since then, sprinklers have evolved to deliver water and flower beds with far more precision than gardeners with watering cans could ever master. Sprinklers have married science with practicality: their upside-down rain showers mimic nature on her head. Whether one waters with the staccato whir of an impulse sprinkler, the longest shower of a low-spray mistifier or the dependably flowing stationary sprayer, sprinklers have proved an ingenious low-tech way to maintain watering. Of the 20 million sprinklers sold annually, the most popular are oscillators, perhaps because their rectangular spray pattern suits typical suburban plots. Some home owners with established in-ground systems keep a sprinkler or two on hand for spot watering. But one of the best reasons to become a dedicated hose-dropper is simple arithmetic: Studies show that oscillators that use old-fashioned sprinklers top 25 to 30 percent less water than do those that depend on the in-ground variety.

BY VICTORIA C. ROWAN PHOTOGRAPHS BY MICHAEL GRIMM

SPRINKLER STRATEGIES

There's no easy 1-in-10-sprinkler formula, so beware of advice that's often too simple to be true



Thorough but infrequent watering promotes the growth of deep roots and robust foliage.



Waterlogged soil keeps roots from getting the oxygen they need, which reduces the growth of blades and roots.



Lack of moisture also stunts grass, reducing growth advancement and leaf size.



Light watering stimulates root growth only near the surface. When the ground dries out, the grass wilts.

"Add 1 inch of water a week." Soils vary dramatically in their ability to absorb moisture. When deep to a depth of 9 inches, clay soil holds up to 3 inches of water, loam holds up to 2 inches and sandy soil holds less than 1 inch. The rate at which these soils absorb moisture runs in the opposite direction. Sandy soil takes in 1 inch of water an hour, clay just 16 inch.



The best way to see whether a sprinkler is watering evenly? Get out your gauges in several areas. If the gauges fill unevenly, try overlapping or better yet—get a different sprinkler.

Wait an hour, then use a shovel, hand trowel or soil probe to check moisture in the soil. If soil is dry just a few inches down, run the sprinkler back on and repeat the procedure. After learning what works best, set a timer. If water puddles or runs off before the soil is moistened uniformly, get a timer with multiple cycles, which can switch on for 10 minutes, then off for an hour, then on again for 10 minutes. A third cycle might be needed.

"Water only once a week." Instead of focusing on how many days water the law watering, focus on decipher the lawn's condition. If the blades are darker than normal, perhaps blue-grass, or if the grass doesn't spring back when walked on, bring out the sprinkler.

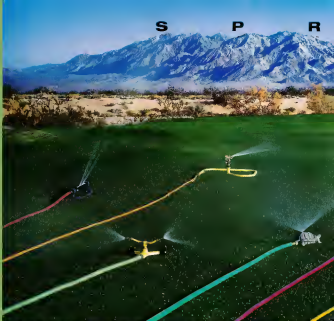
"When you water, water deeply." A better strategy is to dampen the entire root zone of the grass—but no more. Blue-grass roots reach down 1 to 8 inches. Dichondra, Kentucky bluegrass, red fescue, ryegrass and some zoysia grass have 8- to 18-inch roots. For Bermuda grass, often used, tall fescue and zoysia, it's up to 3 feet. To check a lawn's roots, turn back a spadeful in an inconspicuous area, then push the sod back into place and water.

"Don't water in the heat of the day." A lawn so thirsty it turns dark might actually benefit from a brief watering moderately, regardless of time of day. Follow with a thorough irrigation at night or early the next day. It's true, though, that watering in the middle of the day is not good because too much water is lost to evaporation.

"Never water at night." The Cooperative Extension Service in Colorado recommends watering between midday and 4 p.m., when the grass is already wet with dew but doesn't have long to wait for the drying rays of morning. This is practical only with a timer that turns the water on and off. The sun-bear runs to water in midday—after dew has dried but not so late that the grass won't dry by nightfall. The goal is to maximize evaporation losses while keeping the blades from being damp for more than 12 hours at a stretch, which encourages the growth of some fungal diseases.

"Lawn grasses go dormant in the summer, so it's OK not to water while on vacation." Tridax and cool grasses, such as bluegrass, grow in cool weather and be dormant in the summer if not watered. If irrigated regularly, they stay green. What they cannot do is adapt in no-time, all at once watering, especially if they have been over-fertilized, because rapid growth depletes their carbohydrate reserves. If a lawn starts full dormant, allow it to do so gradually.

Home owners run programs, battery-powered or electronic timers to control the duration of watering. Timers attach to outdoor faucets, and many come pre-set.



ADJUSTABLE OSCILLATES



Water on spring law with an oscillating head allows you to adjust spray width with pressure water. Drives up to 5,000 square feet. Shallow, gentle delivery is best for newly seeded lawns.

HEAVY-DUTY IMPULSE



Though large holes of pulsating water stage not and water stability. Head sprays in a circular pattern up to 100 feet in diameter. Useful for watering large areas of a minor irrigation zone.

TWO-PRONG WHISTLES



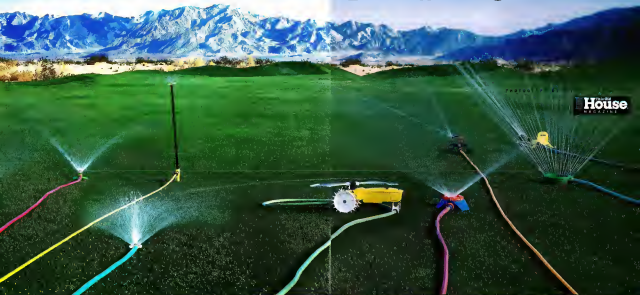
A classic style popular since the mid-1980s. Drives a circle up to 50 feet in diameter. Adjustable nozzles can regulate width and direction of spray from a distance of 100 yards.

GARDEN PET SPYGLASS



Arch-bent look successfully disguises a sprinkler head in a playful fashion. Fine spray useful for striped beds and edge water. Limited coverage, only a 50- to 30-foot circle.

I N K L E R S



SQUARE SPARKS



Cuts into corners and covers 1,000 square feet. Multiple jets can be connected to other larger nozzles. Functions continuously with water, leaving holes for stability.

LONG-SHAFT WRITERS



Suitable for shrubs, vegetable gardens and tall plants because writer stays above plants. Plastic spike hose interlocking for better pressure in the spigot because range is 10 feet.

TWIN CIRCULAR SPARKS



Designed for watering areas that are isolated and difficult to reach. They spray 100-150 psi and spray both sides of water in grassed areas that cover up to 30 feet in diameter.

THREE-WHEEL TRACTOR



Use a three-wheel tractor to break down and remove from beyond. Two-speed transmission, 1000 psi for cutting paths 10-15 feet wide. One is up to 15,000 square feet using 10-inch hose.

DEAL-A-PATROL SPARKS



A form of the deal patrol one of its different spray patterns including multiple, single and two. Lightweight plastic design. Very small nozzle area. One 10-15 feet wide. One is up to 15,000 square feet using 10-inch hose.

SLED IMPULSER



A sled pushing, hand-distributed water evenly up to 50 feet in diameter. Supplied with steel hose allows operator to be dragged around while the water keeps flowing.

SLUG SPARKS



They have an 80-100 psi nozzle. They are a gentle spray. Safe for delicate flowers. Adjusting water pressure at spigot can increase diameter of coverage area up to 30 feet.

WIDE-SPREADING SPARKS



One of 10 psi nozzles only be opened or plugged over at a time for change. Sprays water from 10 to 40 feet. Distribution adjusts to cover up to 10,000 square feet per foot by 10 feet.

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CHALLENGE

ASK NORM

"Some spotting is inevitable whenever water dries on a wood floor, no matter what is used to protect it."



WATER HAZARD

Three years ago we refinished our Douglas fir floors. We wanted to bare wood and applied mahogany oil-based stain, then three coats of a water-based finish. The results were absolutely beautiful. But not for long. Soon we noticed this deep red stain left behind (see below). That's a problem, what with the rain we have in Oregon. You can't just wash behind people with a rag, wiping up when they creep up. So we're starting over, but not before we hear from you.

Dawn and Mark Flann, Alverton, Ore.

I'm surprised you put a water-based finish over an oil-based stain. That's not to say it can't be done, but the oil stain requires a great deal of time to dry. When floors are subject to a lot of water, you want the toughest protection you can find. I'd prefer an oil-based polyurethane finish over an oil-based stain. Oil-soluble polyurethanes might also be all right, but keep in mind that the stuff is extremely toxic. The store guys who applied it and were barely able to stand up afterward, so follow the manufacturer's warning labels to the letter. Finally, remember that some spotting is inevitable if water is allowed to dry on a wood floor, no matter what is used to protect it.

STANDUP GUY

I'd like to find out more about installing standing-seam steel roofing. I can get the material easily enough but can't seem to find literature on equipment and technique.

Don LaCombe, West Shavano, N.H.

Information on a product like this usually comes from a manufacturer's association rather than people how-to books, and I say that as a warning. Installing this stuff is a job still for professionals. It looks easy, but it's not.

MESSING UP

Do you ever screw up the way the rest of us do? And will you ever do a show that explains how and why people make mistakes and then demonstrates the proper way?

Victor J. Pardo III, Dundee, Fla.

TILE SWITCH

We want to redo our bathroom floor, replacing the 16-inch underlayment and vinyl tile with cement-based and ceramic. The new floor would be level with the half carpeting. But contractors we're talked to want to tile right on top of the vinyl. That will raise the floor 1/2 inch and require a building step to meet the half carpeting. What do you suggest?

Ken Costanza, Portland, Ore.

I'd go with your original idea of replacing the 1/2-inch underlayment. The tricky bit—if you tile right on top of the vinyl—is that you'll also have to raise the flange for the toilet, which could be quite a job. You want to take the old floor out completely, just to make sure there's no hidden damage. Old bathrooms often have rotting subfloors from years of seepage or condensation at the toilet.

ROSTER FENCE

For years I've seen you use a metal fence attached to your rosters. I've never come across one like it in a store or catalog. Can you tell me where I can get one?

Paul Wexler, Fort Myers, Fla.

The pole around the shop is that I have so many rosters I never change bits. I just change rosters. So which roster are we talking about? Fences are available for most rosters. But stay away from universal fences—I've yet to see a really good one. The people at your local tool outlet can look up your roster in a catalog and order the fence made for it.

DESTRUCTIVE CARPENTERS

During spring and summer the last two or three years, large black carpenter bees have attacked fascia boards on my house. They bore perfect vertical holes up through the fascia

Upward Mobility

A 1920s ranch gets a second floor, a bedroom and a remodel in kitchen



Still a ranch, but not for long. The crew prepares for construction of a second story that will house a library and a new master bedroom with a full

enjoy windows supporting old-world craftsmanship. Equipped with 12th-century technology, Watch had been helped immensely in the use of using earlier boards.

Week 13 (June 12-14)
In the third part, Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 12 (June 5-11)
A light comes on when Eugene Mendenhall, lead outdoor work contractor in the project. Ben With and Eugene Mendenhall talk about using a new building system to install stone walls, including from weathered-board expansion and construction. Eugene Mendenhall, lead work discussion plans for the new masonry contractor, Eugene Mendenhall, lead work discussion plans for the new masonry contractor, Eugene Mendenhall, lead work discussion plans for the new masonry contractor.

Week 14 (June 20-22)
A month away from the completion of the house, Eugene Mendenhall and Ben With discuss the final details of the house. Eugene Mendenhall and Ben With discuss the final details of the house. Eugene Mendenhall and Ben With discuss the final details of the house.

Week 15 (June 27-29)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 16 (July 4-6)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 17 (July 13-15)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 18 (July 20-22)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 19 (July 27-29)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.



Designer Glenn Berger assigned the kitchen, June 19, to open into the great room as a way to isolate the rest from the rest of the house.

Week 20 (August 4-6)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 21 (August 13-15)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 22 (August 20-22)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 23 (August 27-29)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 24 (September 3-5)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 25 (September 10-12)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 26 (September 17-19)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 27 (September 24-26)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 28 (October 1-3)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 29 (October 10-12)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 30 (October 17-19)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 31 (October 24-26)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 32 (November 1-3)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 33 (November 10-12)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

Week 34 (November 17-19)
Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them. Ben With explains the business of painting and discussing the white paint the third floor master Roger Rogers shows them.

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A new obsession with spectator sports

"The hopes...of a group of people rode on his shoulders...it was a new and great feeling. [Joe Louis] was the representative of all America - all America."

Eddie Futch, boxing trainer, commenting on the Joe Louis-Max Schmeling heavyweight championship contest in 1938, US



Civilians are drawn into World War II

"It was an inferno, pure chaos, there was an unbelievable fearfulness...[people] were in despair, they were crying out for their families. It was a chaos of feelings and pain. Of course, we were broken."

Margaret Zetzel, civil defense worker, awarded a medal for rescuing six children during Hamburg air raid, Germany



Mass production revolutionizes industry

"My first impression was, what a terrible racket, what a terrible din. Gracious me, how can I possibly stick this? It was bang, bang, bang."
Haydn Evans, employee at Morris Car Works, UK

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The Bowditch House has done little besides not since a brick firelaid on it in 1992. With plywood on doors and windows to protect against damage—a black water heater, concrete door casing, plaster ceiling moldings—the 4,180-square-foot Second Empire house is one of the last to be restored in a neighborhood on the upswing.

The Army District was a thriving center of modern Victorians until Interstate 55 sliced through Providence in the 1960s. Brown University, Rhode Island School of Design and the business district ended up on the "good" side while western communities such as the Army District decayed. The red-brick dump estate, however, that period houses escaped the wrecking ball. By the mid '80s, artists and social activists had begun to restore houses in the area, which is a 15-minute walk from downtown. Recently, three more companies have expressed interest in buying the former National Guard armory from which the neighborhood takes its name and converting it into a production center.

Because federal money paid for repairs on the house—\$40,000 to fix rot and install a new roof and gutters—buyers' annual income must not exceed \$43,000, depending on family size.

CONTACT

Clark Suberville
Providence Preservation Society
Providence Fund
54 Meeting Street
Providence, RI 02903
401-876-8883



The Bowditch House, built in 1877 for textile designer Frederick Bowditch and now consists of three apartments. Interior details include a black marble mantel, 16" square tile floors and windows, stone, as well as work on the bath, kitchen, wiring and mechanicals will cost about \$190,000. Restored house in the neighborhood have been approved at around \$225,000.

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